



## TEST REPORT

Report Number: 100934544MIN-001B  
Project Number: G100934544

Testing performed on the  
SALLISNODE  
FCC ID: UKCNRF  
Industry Canada ID: 10088A-NRF

to  
47 CFR Part 15. 247:2010  
RSS- 210, Issue 8, 2010

For  
Salto Systems SL

Test Performed by:  
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Test Authorized by:  
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SPAIN

Prepared by: U. Spector  
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Date: March 15, 2013

Reviewed by: S. Khazon  
Simon Khazon

Date: March 15, 2013

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## 1.0 GENERAL DESCRIPTION

<b>Model:</b>	SALLISNODE
<b>Type of EUT:</b>	RF Node
<b>Intertek Sample ID:</b>	MIN1212210942-001
<b>FCC ID:</b>	UKCNRF
<b>Industry Canada ID:</b>	10088A-NRF
<b>Related Submittal(s) Grants:</b>	None
<b>Company:</b>	Salto Systems SL
<b>Customer:</b>	Mr. Julen Gutierrez
<b>Address:</b>	Pol. Lanbarren, c/Arkotz 9 20180-OIARTZUN SPAIN
<b>Phone:</b>	+34 943 344 731
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<b>e-mail:</b>	<a href="mailto:j.gutierrez@saltosystems.com">j.gutierrez@saltosystems.com</a>
<b>Test Standards:</b>	<input checked="" type="checkbox"/> 47 CFR, Part 15:2010, §15.247 <input checked="" type="checkbox"/> RSS-210, Issue 8, 2010 <input checked="" type="checkbox"/> RSS-Gen, Issue 3, 2010 <input checked="" type="checkbox"/> 47 CFR, Part 15:2010, §15.107 and §15.109, Class B <input checked="" type="checkbox"/> ICES-003, Issue 5:2012 <input type="checkbox"/> Other [REDACTED]
<b>Type of radio:</b>	<input checked="" type="checkbox"/> Stand -alone <input type="checkbox"/> Module <input type="checkbox"/> Hybrid
<b>Date Sample Submitted:</b>	January 7, 2013
<b>Test Work Started:</b>	January 7, 2013
<b>Test Work Completed:</b>	January 11, 2013
<b>Test Sample Conditions:</b>	<input type="checkbox"/> Damaged <input type="checkbox"/> Poor (Usable) <input checked="" type="checkbox"/> Good



### 1.1 Product Description; Test Facility

<b>Product Description:</b>	2.4GHz Sallis RF Node
<b>Transmitter Type:</b>	<input type="checkbox"/> FHSS <input checked="" type="checkbox"/> Digital Modulation <input type="checkbox"/> WiFi <input type="checkbox"/> Blue Tooth
<b>Operating Frequency Range(s):</b>	From 2400 to 2483.5 MHz
<b>Number of Channels:</b>	16
<b>Modulation:</b>	O-QPSK with DSSS
<b>Emission Designator:</b>	1M85GXD
<b>Antenna(s) Info:</b>	Antenna Type: PCB Trace Gain: 3.3dBi
<b>Antenna Installation:</b>	<input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory
<b>Transmitter power configuration:</b>	<input type="checkbox"/> Internal battery <input checked="" type="checkbox"/> External power source <input checked="" type="checkbox"/> 100-240VAC from AC/DC Power Adapter ADPV500 <input type="checkbox"/> 230VAC <input type="checkbox"/> 400VAC <input type="checkbox"/> 12VDC from <input type="checkbox"/> Other: <span style="background-color: gray; color: gray;">████████</span> 0.3Amp. <input checked="" type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz
<b>Test Facility Accreditation:</b>	A2LA (Certificate No. 1427.01)
<b>Test Methodology:</b>	Measurements performed according to the procedures in ANSI C63.10-2009 and FCC DTS Measurement Guide

## 1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

- Standby
- Continuous transmissions (modulated signal)
- Continuous transmissions (un-modulated signal)
- Continuous receiving
- Test program (customer specific)
- See below

### Operating modes of the EUT:

No.	Description
1	RF Node was connected to Router via "Node Connector Cable". RF Node Transmitter was activated from the Router. Test was performed at low channel, middle channel, and upper channel

### Cables:

No.	Type	Length	Designation	Note
1	Ethernet CAT45	6ft.	not shielded, communication cable	
2	AUX Power wires	6ft.	2-wires not shielded	
3	Node Connection Wires	6ft.	4-wires not shielded	

### Support equipment/Services:

No.	Item	Description
1	Sallis Router	Router

## 1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

- Normal

<b>Temperature:</b>	+15 to +35 ° C
<b>Humidity:</b>	20-75 %
<b>Atmospheric pressure:</b>	86-106 kPa

- Extreme

<input type="checkbox"/> <b>Temperature:</b>	-20 to +50 ° C
<input type="checkbox"/> <b>Supply voltage:</b>	85% to +115%

## 1.4 Measurement uncertainty

The expanded uncertainty ( $k = 2$ ) for radiated measurements has been determined to be:

$\pm 4$  dB at 10m and  $\pm 5.4$  dB at 3m

The expanded uncertainty ( $k = 2$ ) for conducted measurements at antenna terminal has been determined to be:

$\pm 1.0$  dB

The expanded uncertainty ( $k = 2$ ) for line conducted measurements has been determined to be:

$\pm 2.6$  dB

## 1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where: FS = Field Strength in dB( $\mu$ V/m)

RA = Receiver Amplitude in dB( $\mu$ V)

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB( $m^{-1}$ )

AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB( $\mu$ V) is obtained. The antenna factor of 7.4 dB( $m^{-1}$ ) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB( $\mu$ V/m).

$$RA = 48.1 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(m^{-1})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 16.0 \text{ dB}$$

$$FS = RA + AF + CF - AG$$

$$FS = 48.1 + 7.4 + 1.6 - 16.0$$

$$FS = 41.1 \text{ dB}(\mu\text{V}/\text{m})$$

**General notes:**



## 2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.247(b), (c) / RSS-210 A8.4	Maximum peak output power	Pass
15.247(a) / RSS-210 A8.2	6dB bandwidth of the digital modulation system and Emissions Bandwidth	Pass
15.247(e) / RSS-210 A8.2	Power spectral density	Pass
15.247(d) / RSS-210 A8.5	Antenna conducted spurious emissions	Pass
15.247(d) / RSS-210 A8.5	Radiated spurious emissions	Pass
15.247(i) / RSS- Gen 5.5	RF Exposure Compliance	Pass
15.207 / RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	Pass
15.109 / ICES-003	Receiver/digital device radiated emissions	Pass
15.107 / ICES-003	Digital device conducted emissions	Pass



### 3.0 TEST CONDITIONS AND RESULTS

#### 3.1 Maximum peak output power

Test result: Pass

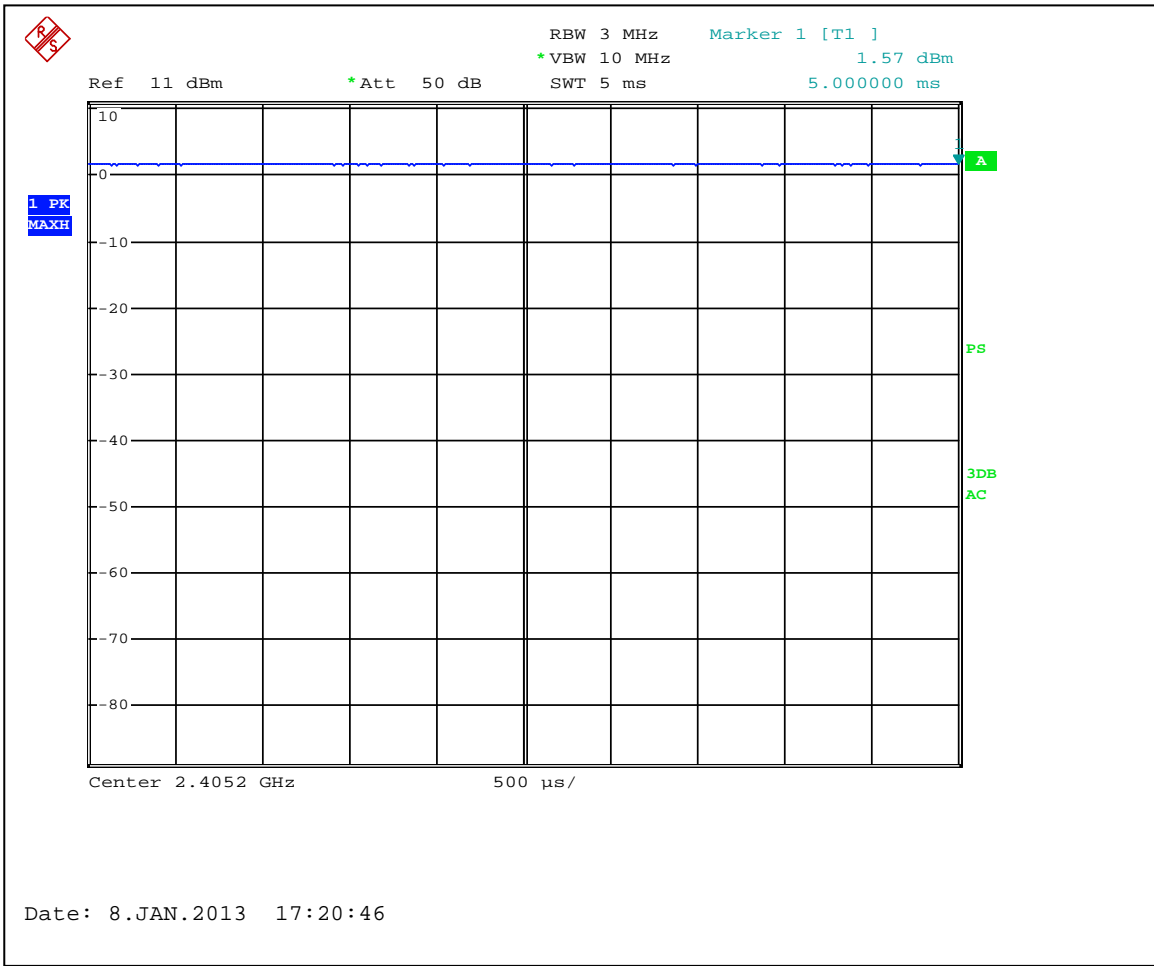
Max. Margin: 27.1dB below the limits

<b>Power Output:</b>	<b>Conducted</b>					
<b>Frequency Range:</b>	<input type="checkbox"/> 902-928MHz		<input checked="" type="checkbox"/> 2400-2483.5MHz		<input type="checkbox"/> 5725-5850MHz	
<b>Low Frequency MHz</b>	<b>Measured power dBm</b>	<b>Attenuation dB</b>	<b>Power at Antenna dBm</b>	<b>Limit dBm</b>	<b>Limit Reduction dB</b>	<b>Margin dB</b>
2405.20	1.6	1.3	2.9	30	0	-27.1
<b>Middle Frequency MHz</b>						
2445.20	1.1	1.3	2.4	30	0	-27.6
<b>Upper Frequency MHz</b>						
2480.00	0.4	1.3	1.7	30	0	-28.3
<b>RBW:</b>	<input type="checkbox"/> 1MHz		<input checked="" type="checkbox"/> 3MHz		<input type="checkbox"/> 10MHz	
<b>VBW:</b>	<input type="checkbox"/> 1MHz		<input checked="" type="checkbox"/> 10MHz		<input type="checkbox"/> 10MHz	
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> < 6dBi		<input type="checkbox"/> >6dBi and = <input type="text"/> dBi, Output power reduction = <input type="text"/> dB			

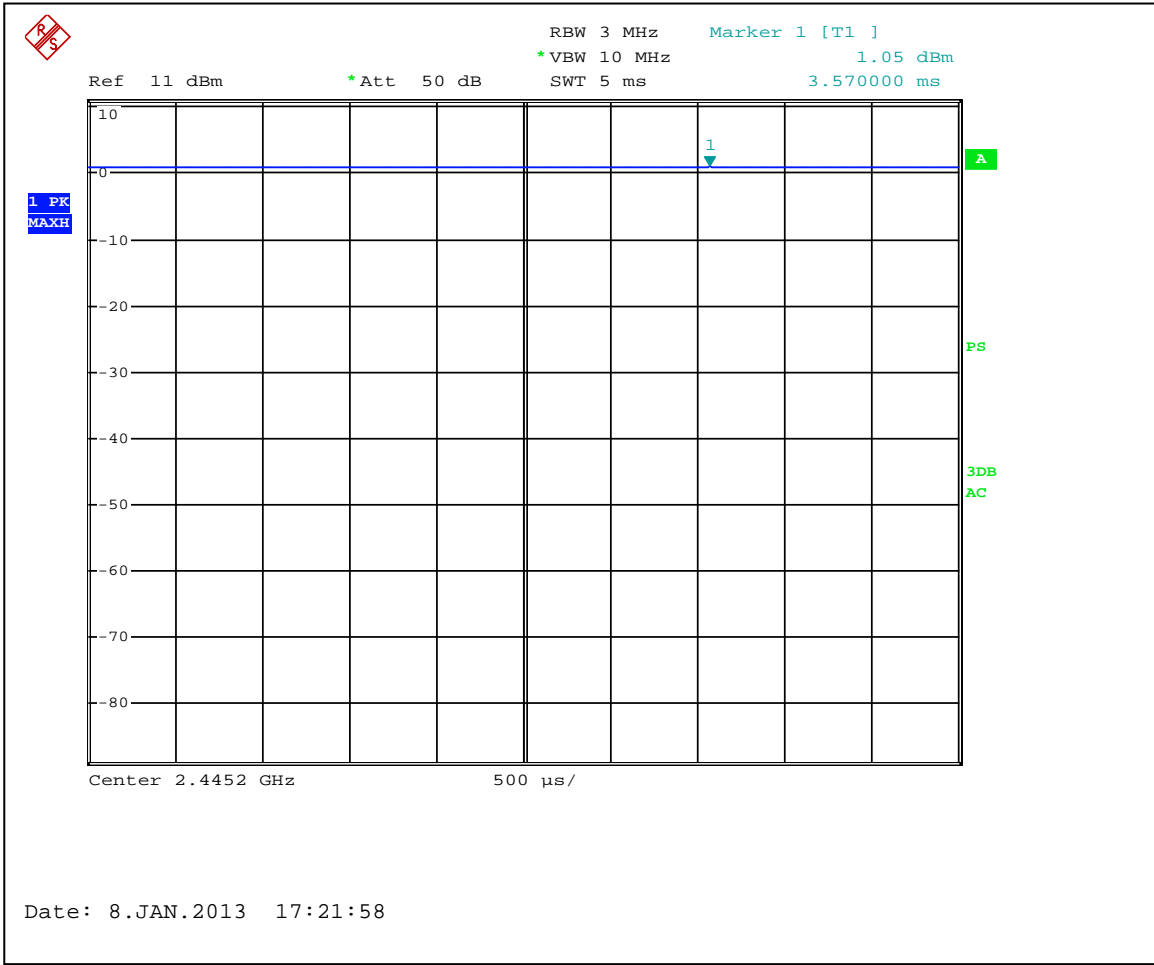
Notes: None

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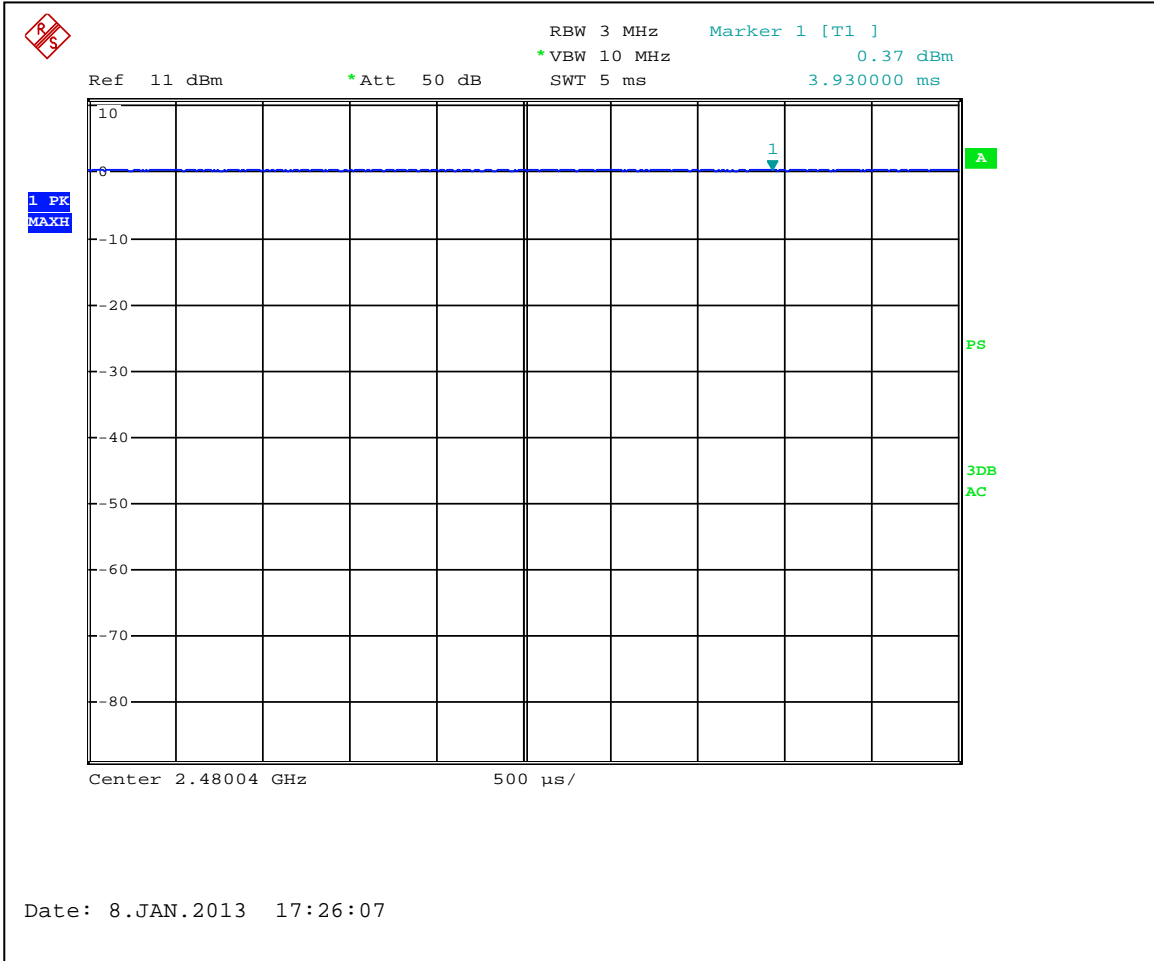




Graph 3.1.1



Graph 3.1.2



Graph 3.1.3

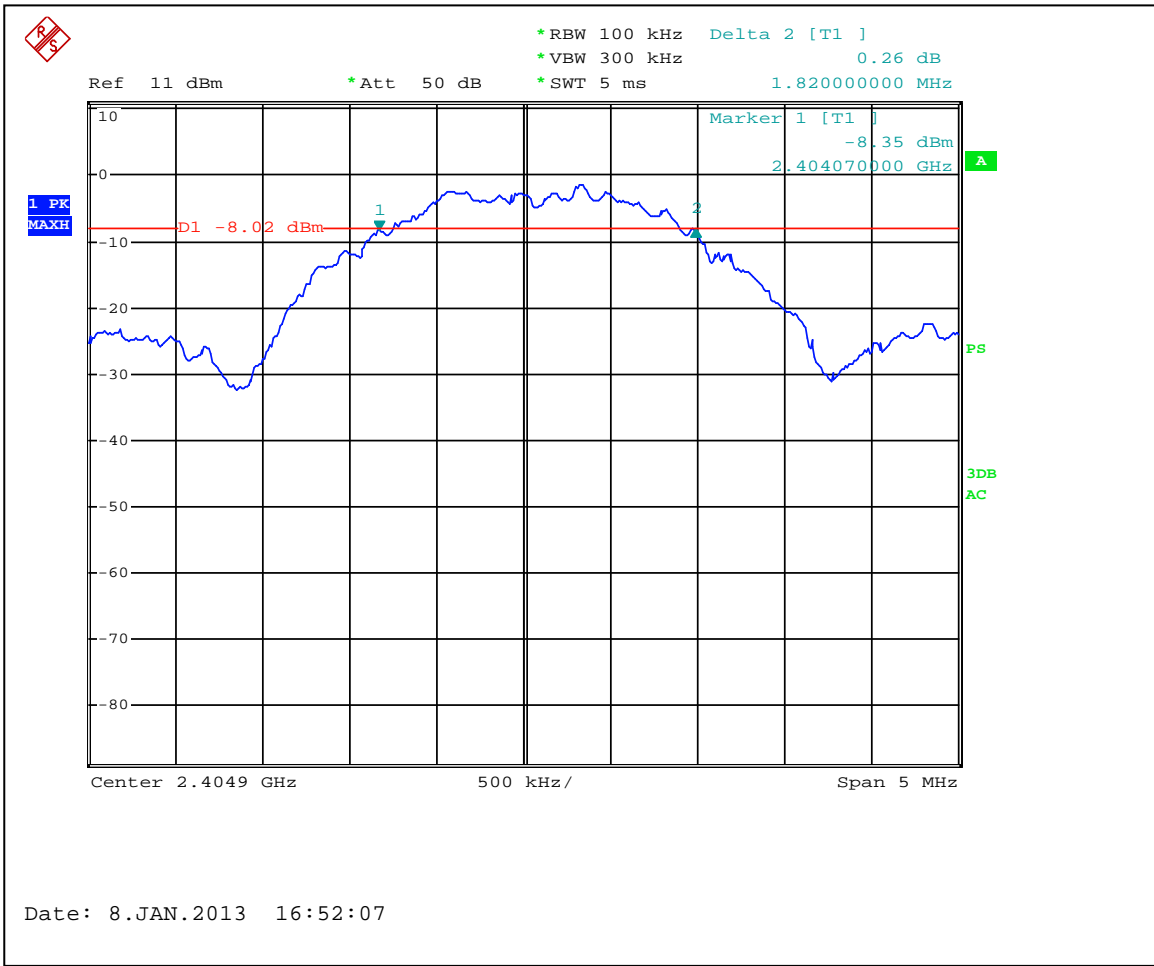


### 3.2 6dB bandwidth of the digital modulation

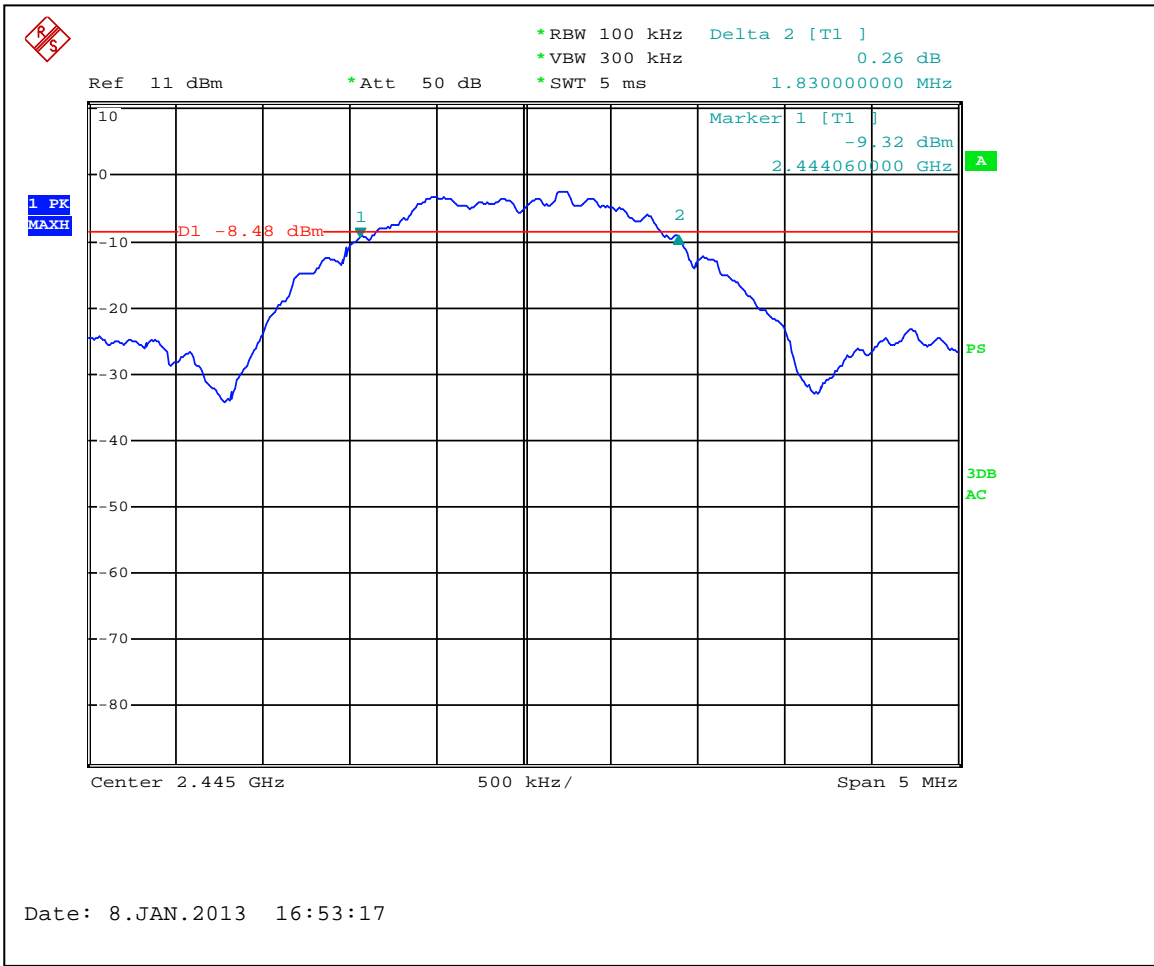
Low Frequency Channel kHz	Middle Frequency Channel kHz	Upper Frequency Channel kHz	Minimum Bandwidth kHz	Result
1820	1830	1830	500	Pass
<b>RBW:</b>	<input checked="" type="checkbox"/> 100kHz	<input type="checkbox"/> other [redacted] kHz		
<b>VBW:</b>	<input checked="" type="checkbox"/> 300kHz	<input type="checkbox"/> 300kHz	<input type="checkbox"/> other [redacted] kHz	

Notes: None

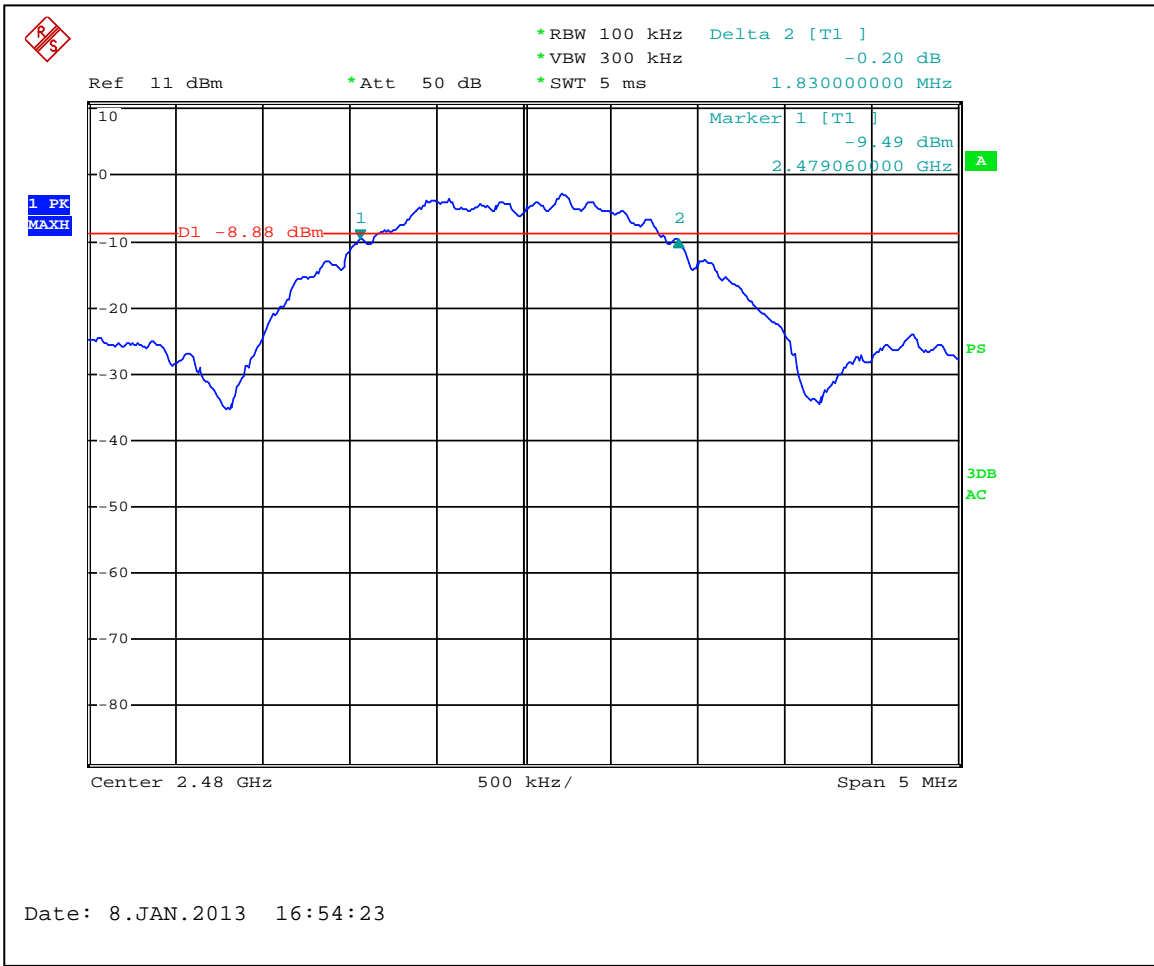
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**Graph 3.2.1**



Graph 3.2.2



**Graph 3.2.3**



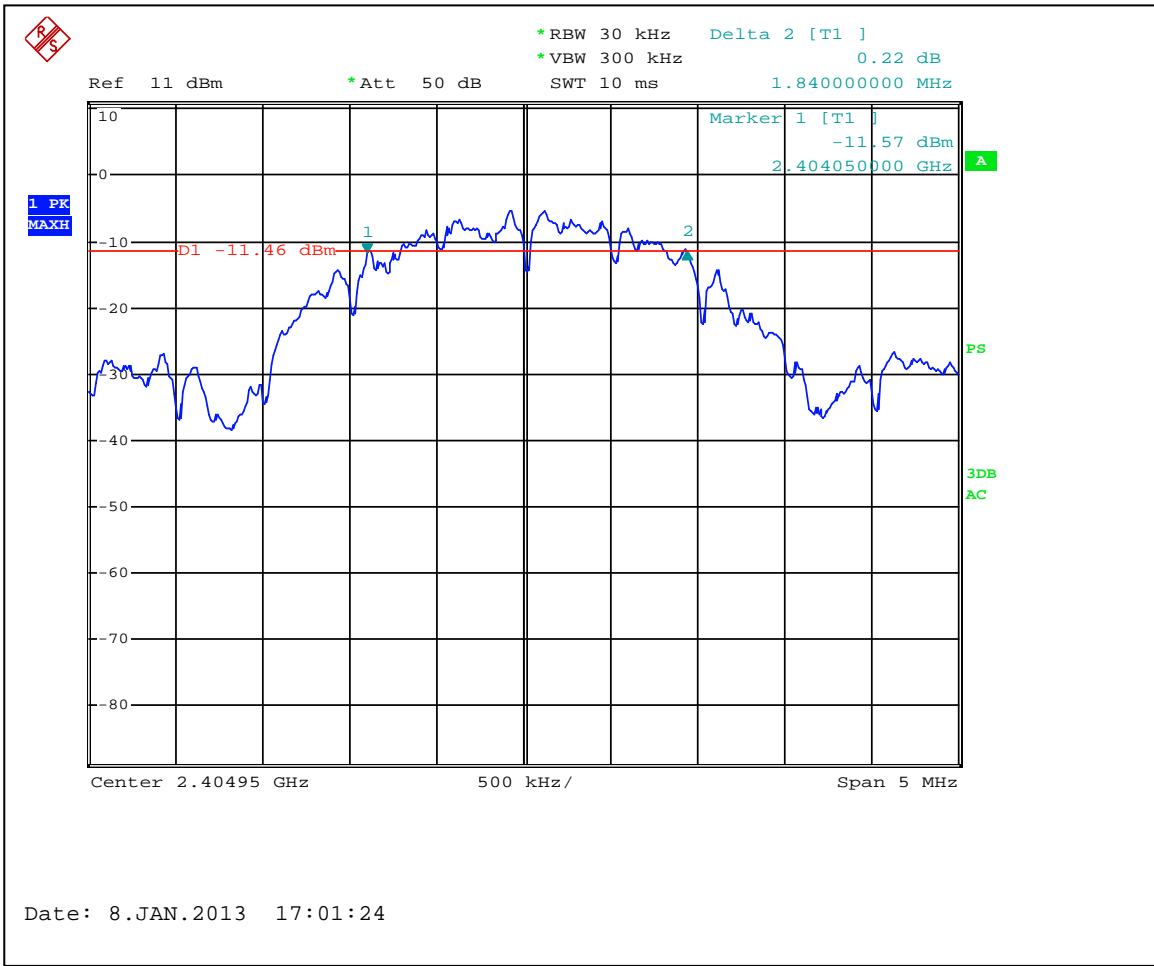
### 3.2.1 Emission bandwidth (EBW) of the digital modulation

Low Frequency Channel kHz	Middle Frequency Channel kHz	Upper Frequency Channel kHz	Minimum Bandwidth kHz	Result
1840	1840	1850	500	Pass
<b>RBW:</b>	<input checked="" type="checkbox"/> 50kHz <input type="checkbox"/> other [ ] kHz			
<b>VBW:</b>	<input checked="" type="checkbox"/> 300kHz <input type="checkbox"/> 300kHz <input type="checkbox"/> other [ ] kHz			

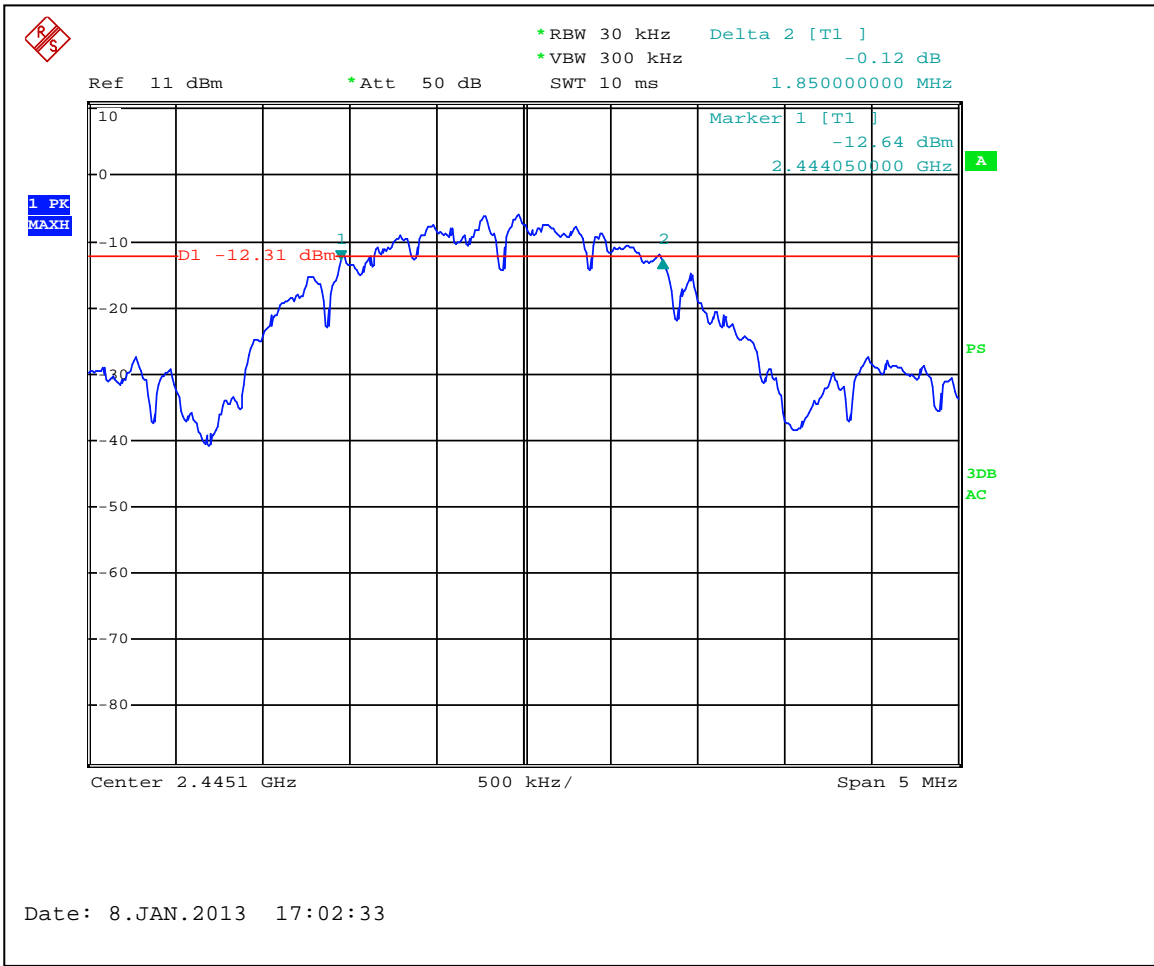
**Notes:**        None

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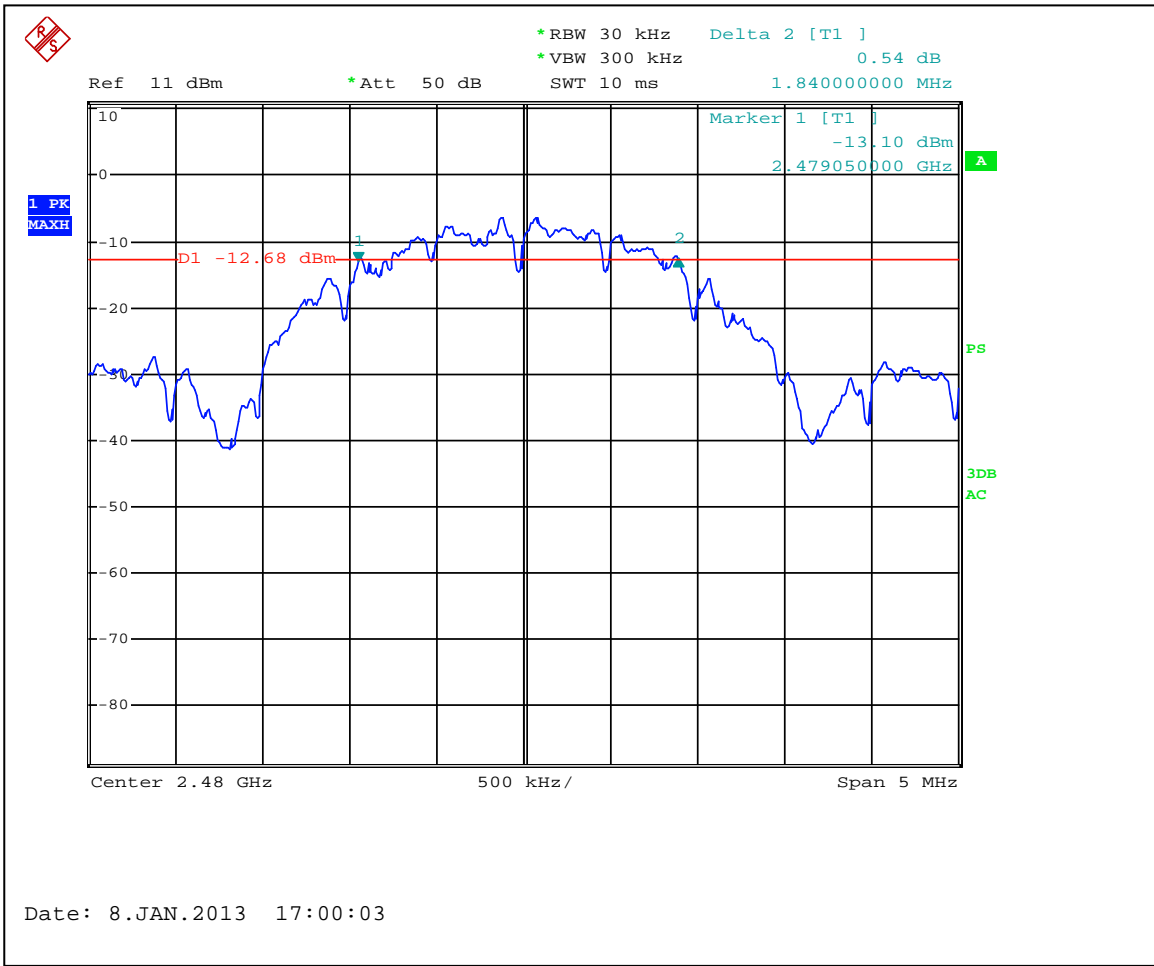




Graph 3.2.1.1



Graph 3.2.1.2



Graph 3.2.1.3

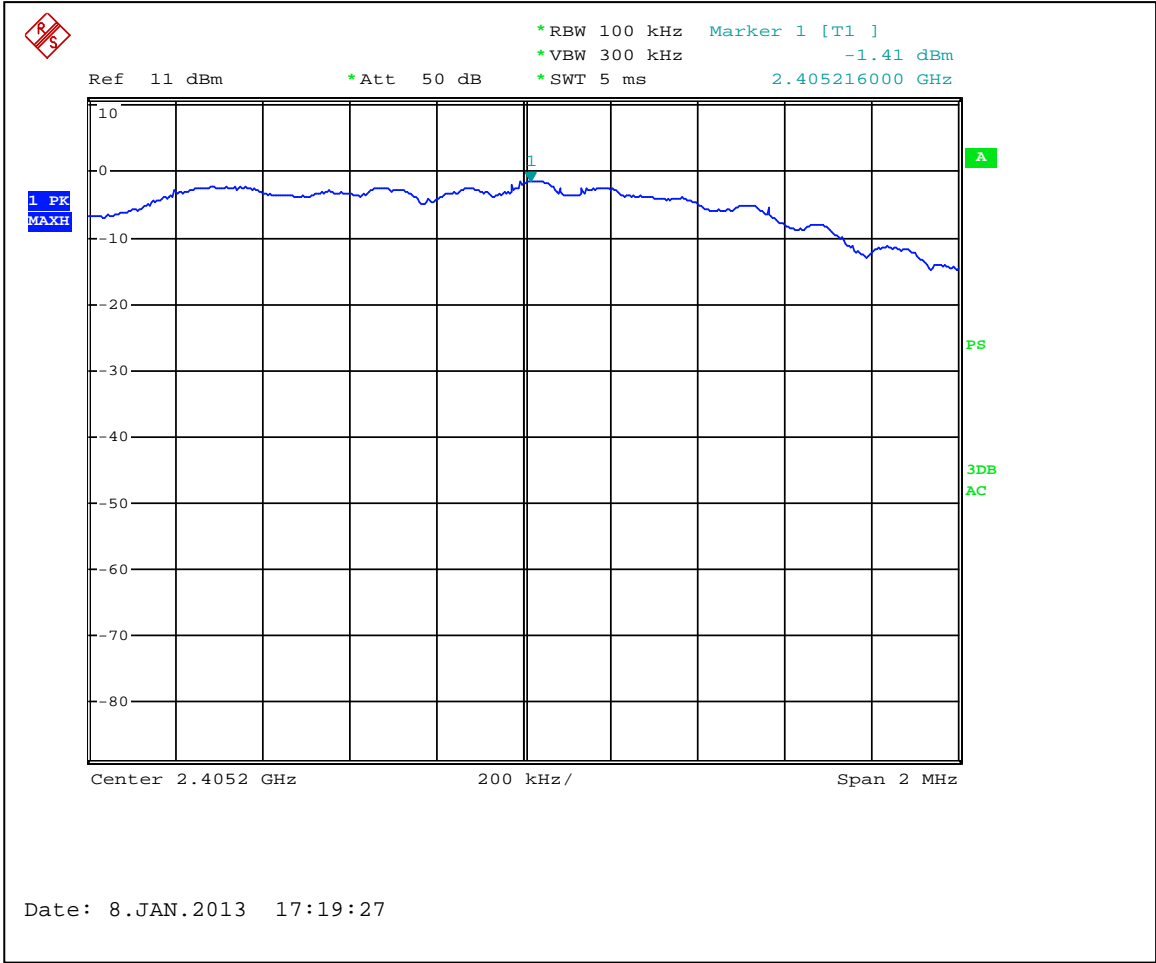


### 3.3 Power spectral density

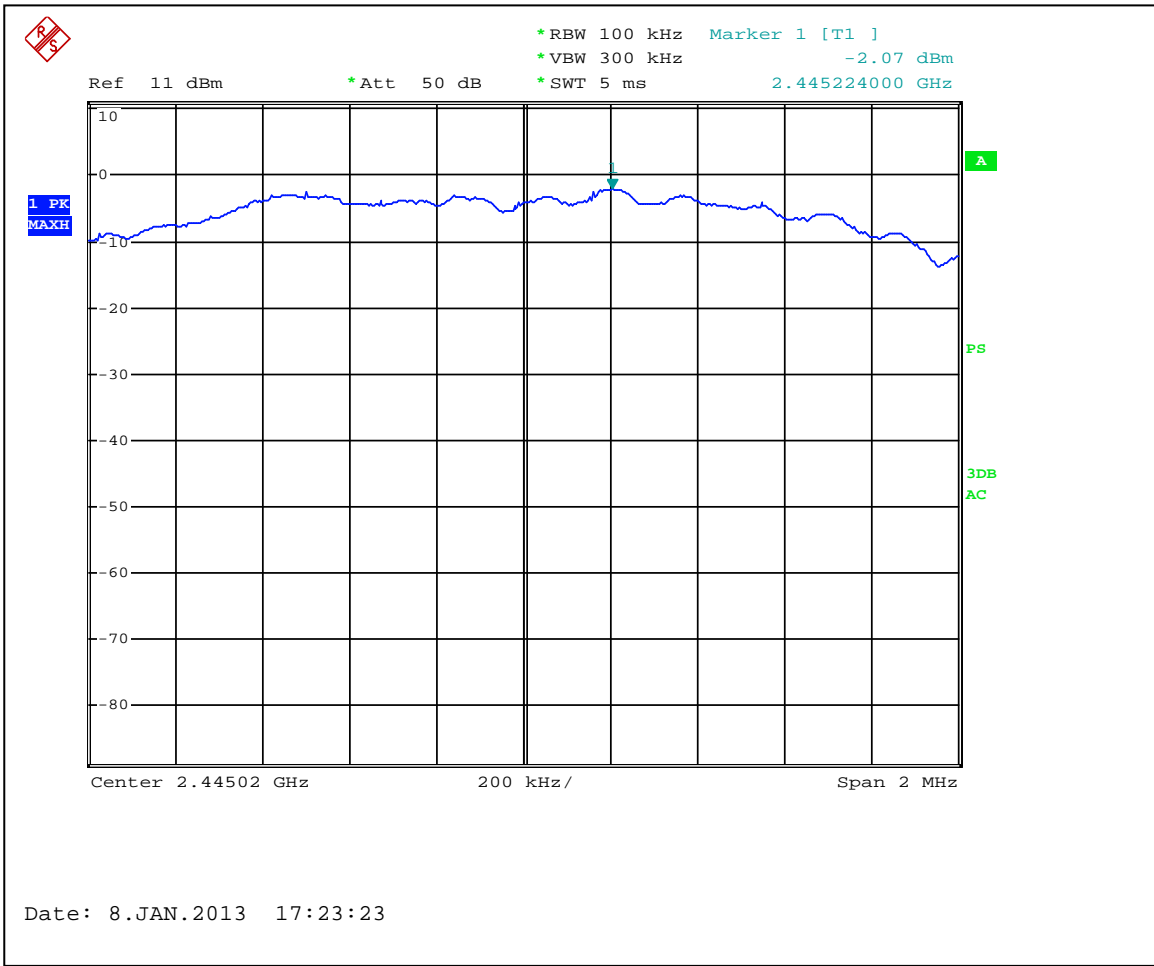
Power Output:	<input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated				
	Measured Density dBm	Power Spectral Density (dBm) @ RBW 100kHz	Power Spectral Density (dBm) @ RBW 3kHz	Limit dBm	Margin dB
Low Frequency Channel	-1.4	-0.1	-15.3	8	-23.3
Middle Frequency Channel	-2.1	-0.8	-16.0	8	-24.0
Upper Frequency Channel	-2.5	-1.2	-16.4	8	-24.4
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz <input checked="" type="checkbox"/> VBW=300KHz <input checked="" type="checkbox"/> Span=2MHz <input checked="" type="checkbox"/> Sweep=Auto				
<b>Antenna Gain:</b>	<input checked="" type="checkbox"/> < 6dBi and = <input type="text"/> dBi <input type="checkbox"/> >6dBi and = <input type="text"/> dBi, limit reduction = <input type="text"/> dB				

**Notes:**      The Power Spectral Density was calculated adding the cable/attenuator loss of 1.3dB from the measured density value.  
 The observed power level at RBW=100kHz was adjusted by reducing the measured power by a bandwidth correction factor (BWCF)=15.2dB

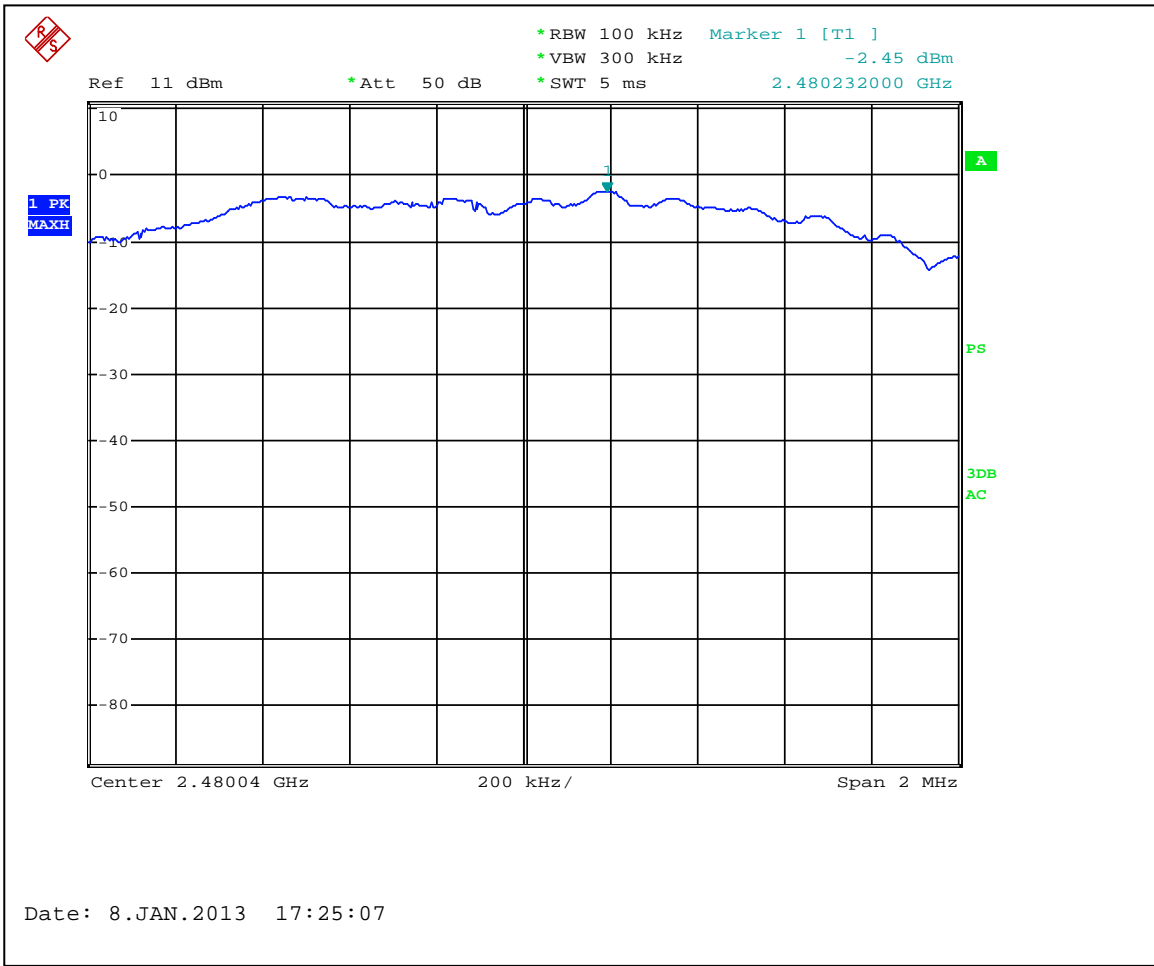
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Graph 3.3.1



Graph 3.3.2



Graph 3.3.3



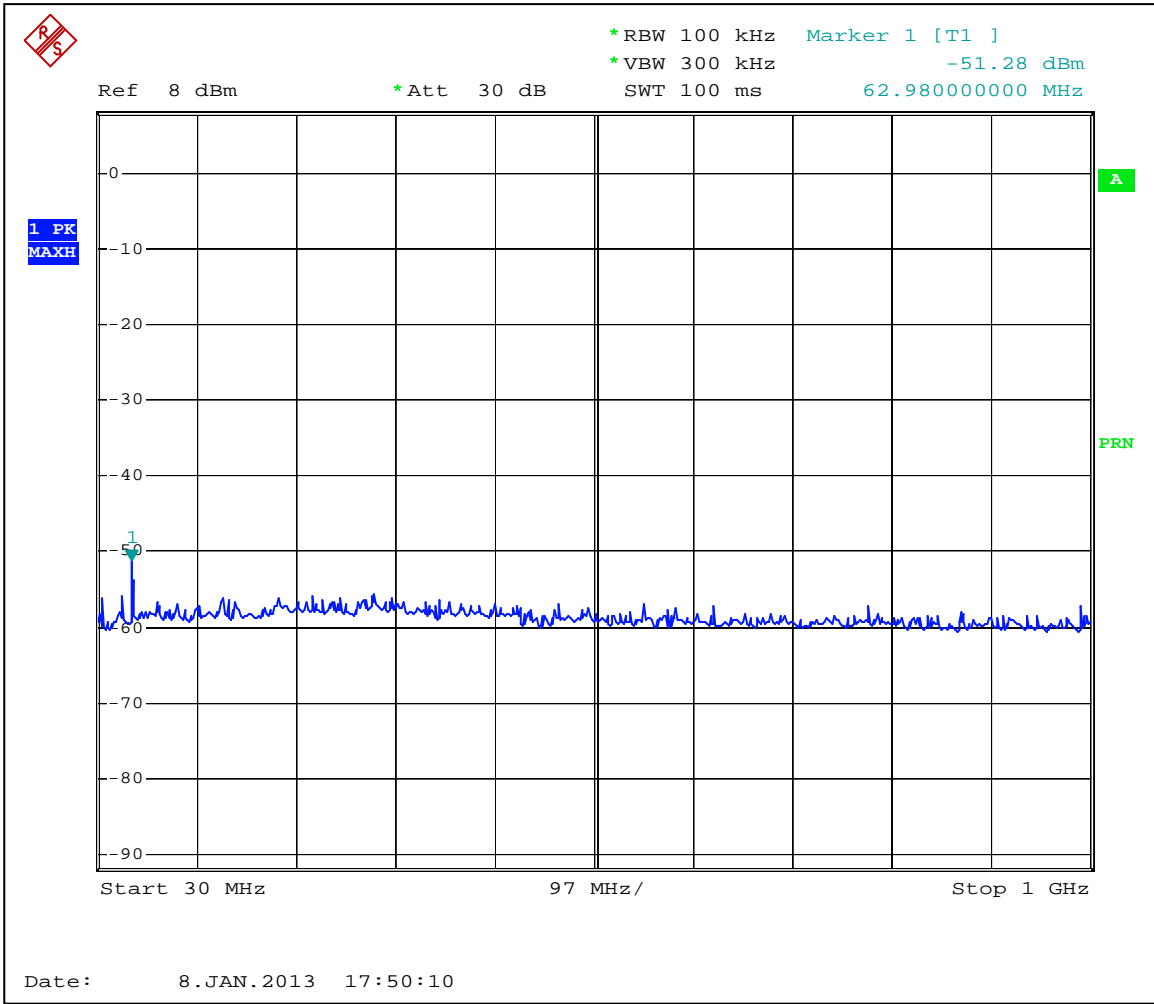
### 3.4 Antenna conducted spurious emissions

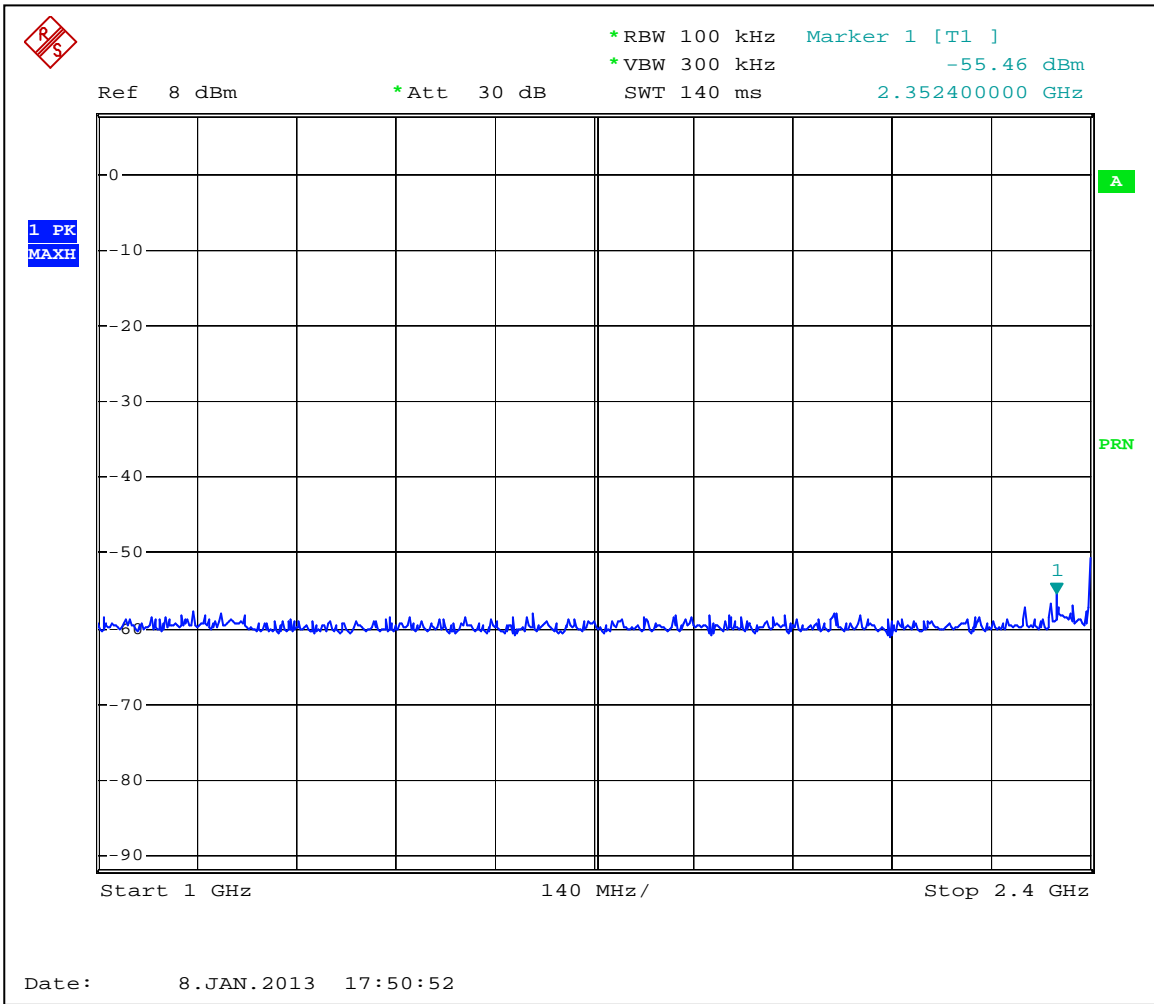
	Minimum Measured Attenuation dB	Minimum Allowed Attenuation dB	Margin dB
Low Frequency Channel	-51.3	20	-71.3
Middle Frequency Channel	-46.4	20	-66.4
Upper Frequency Channel	-45.1	20	-65.1
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

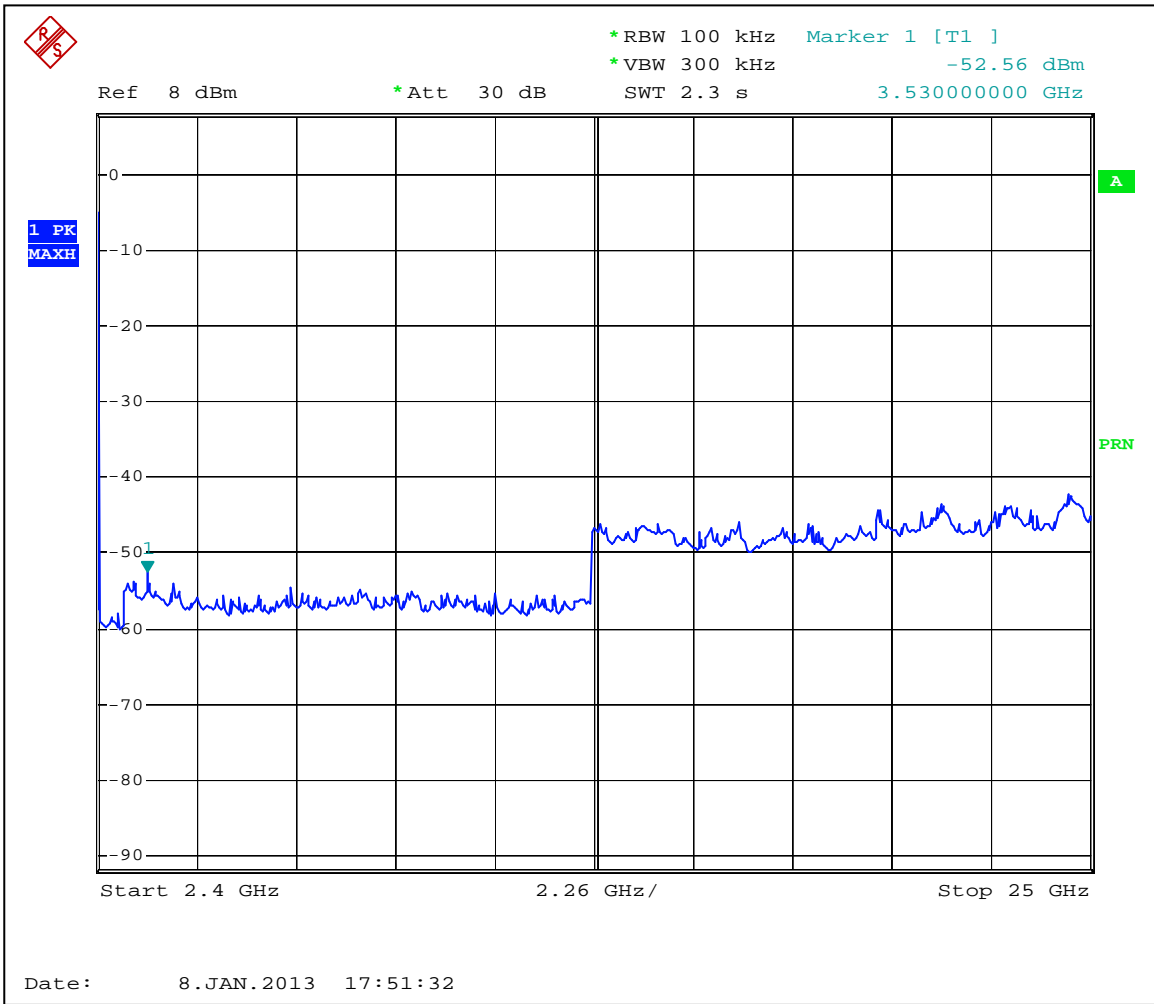
Notes: None

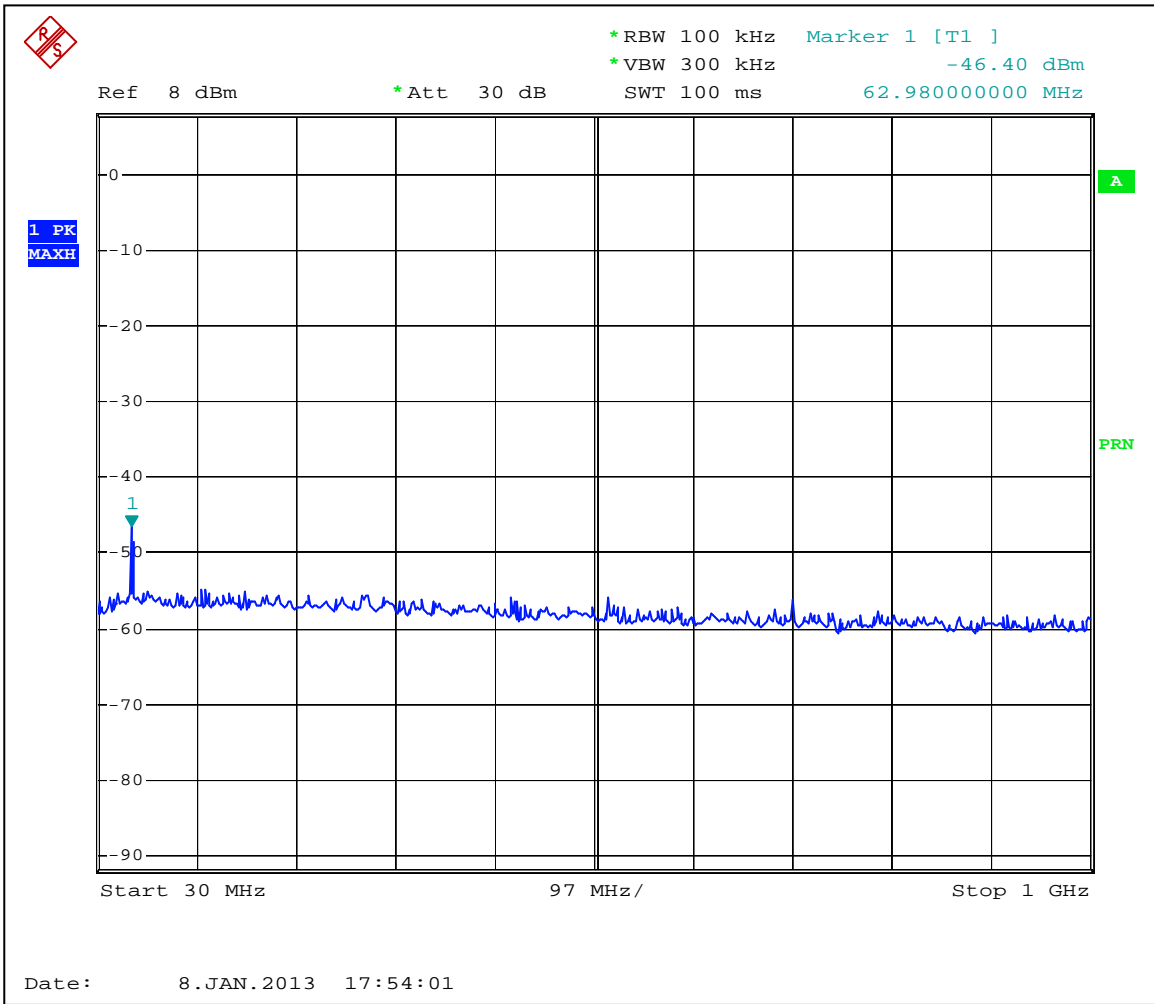
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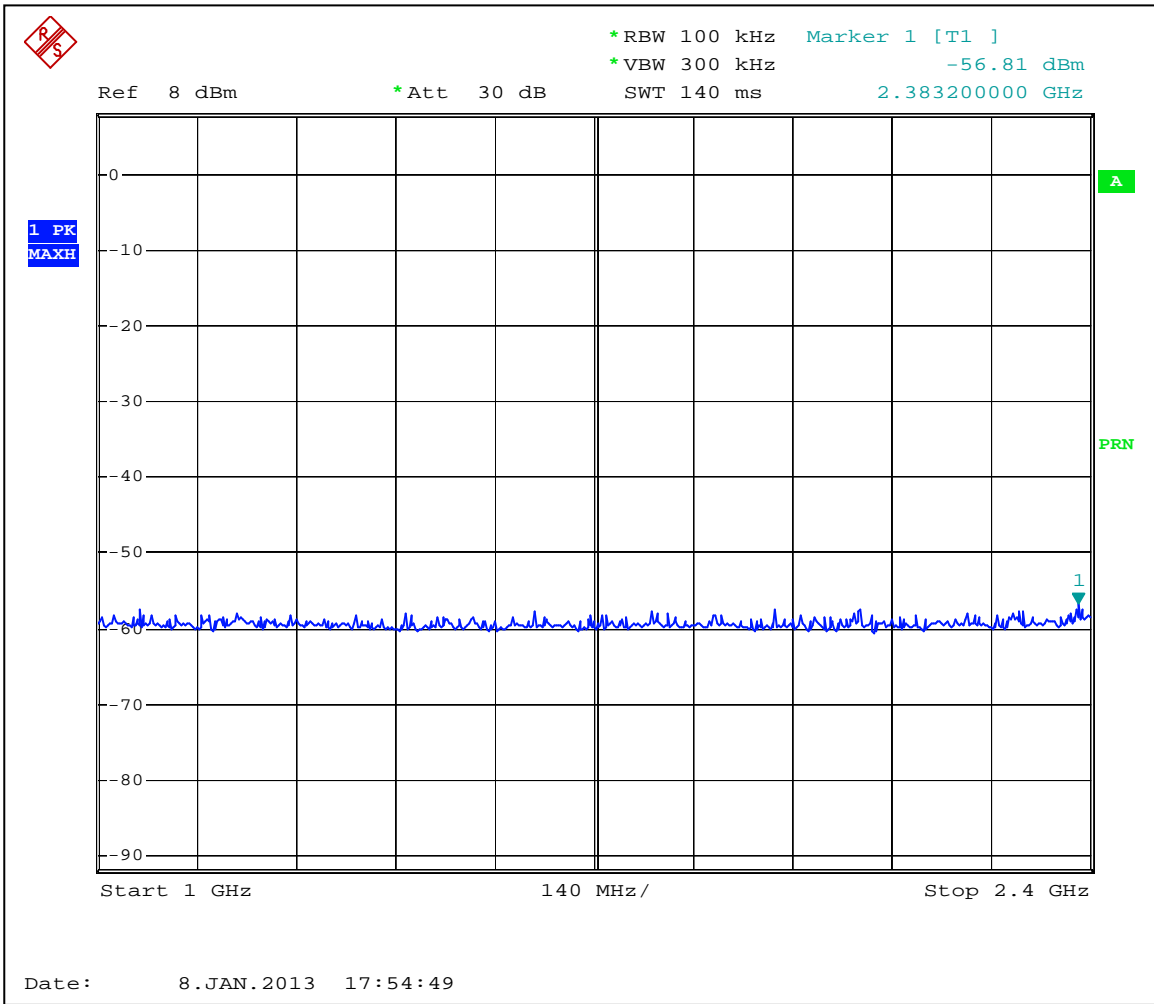


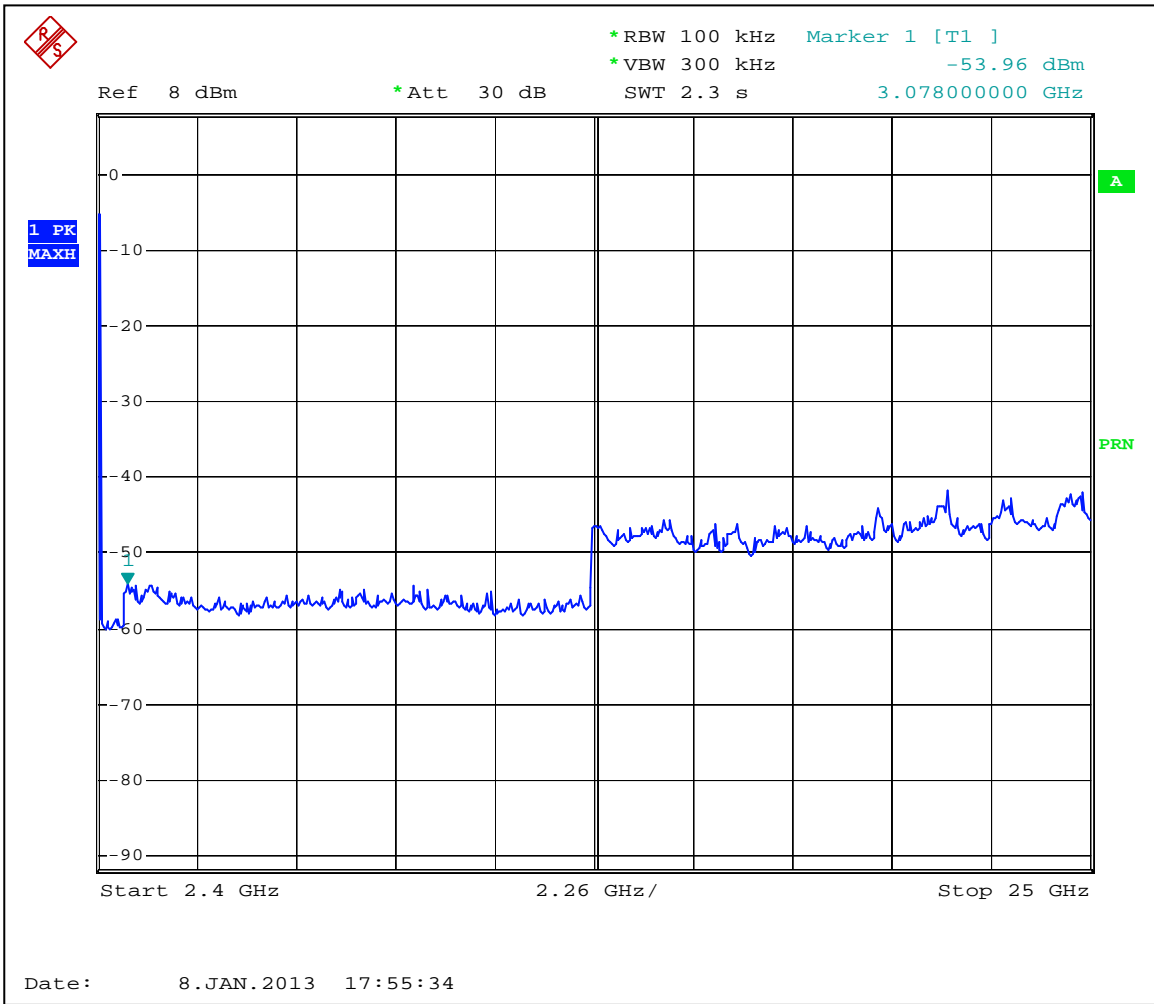


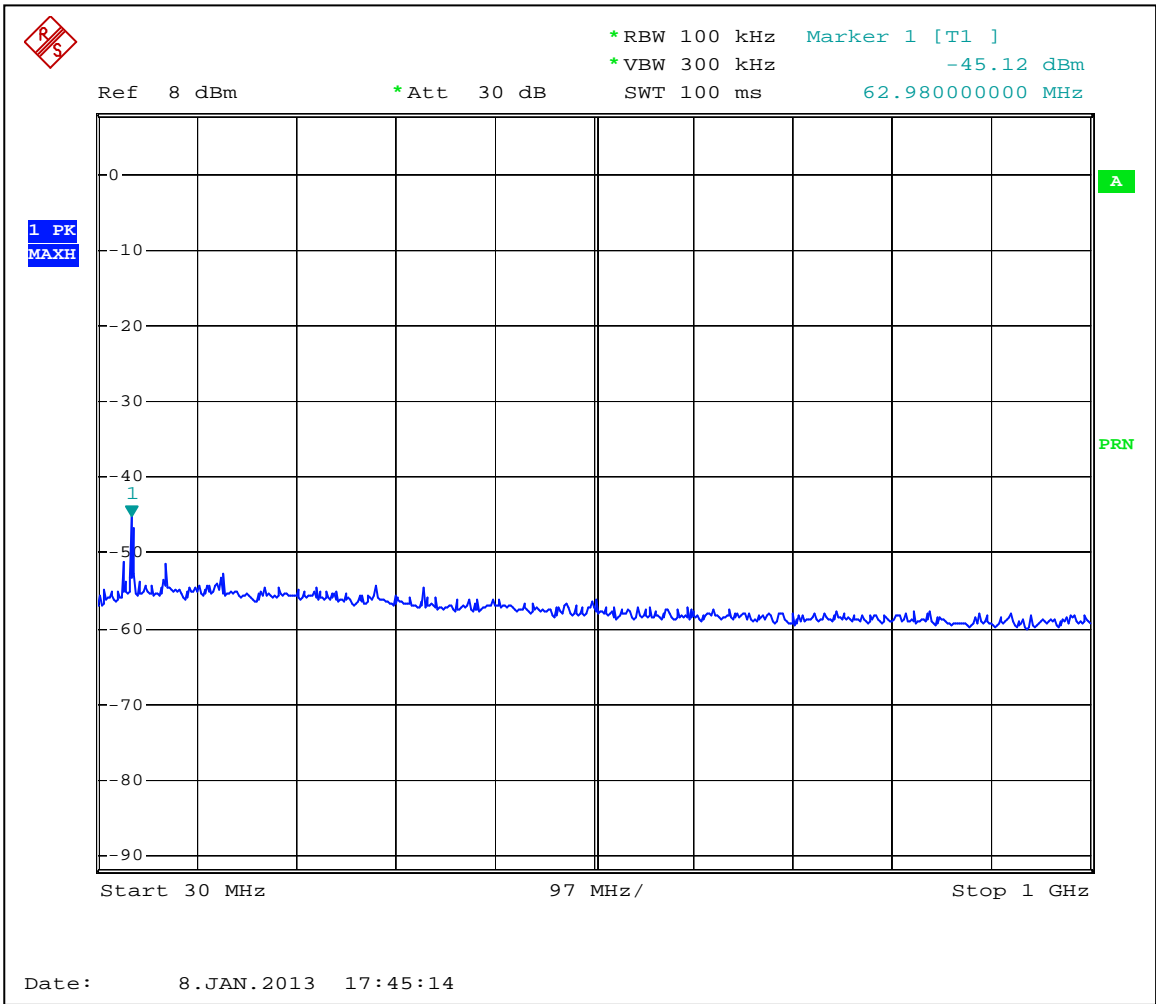


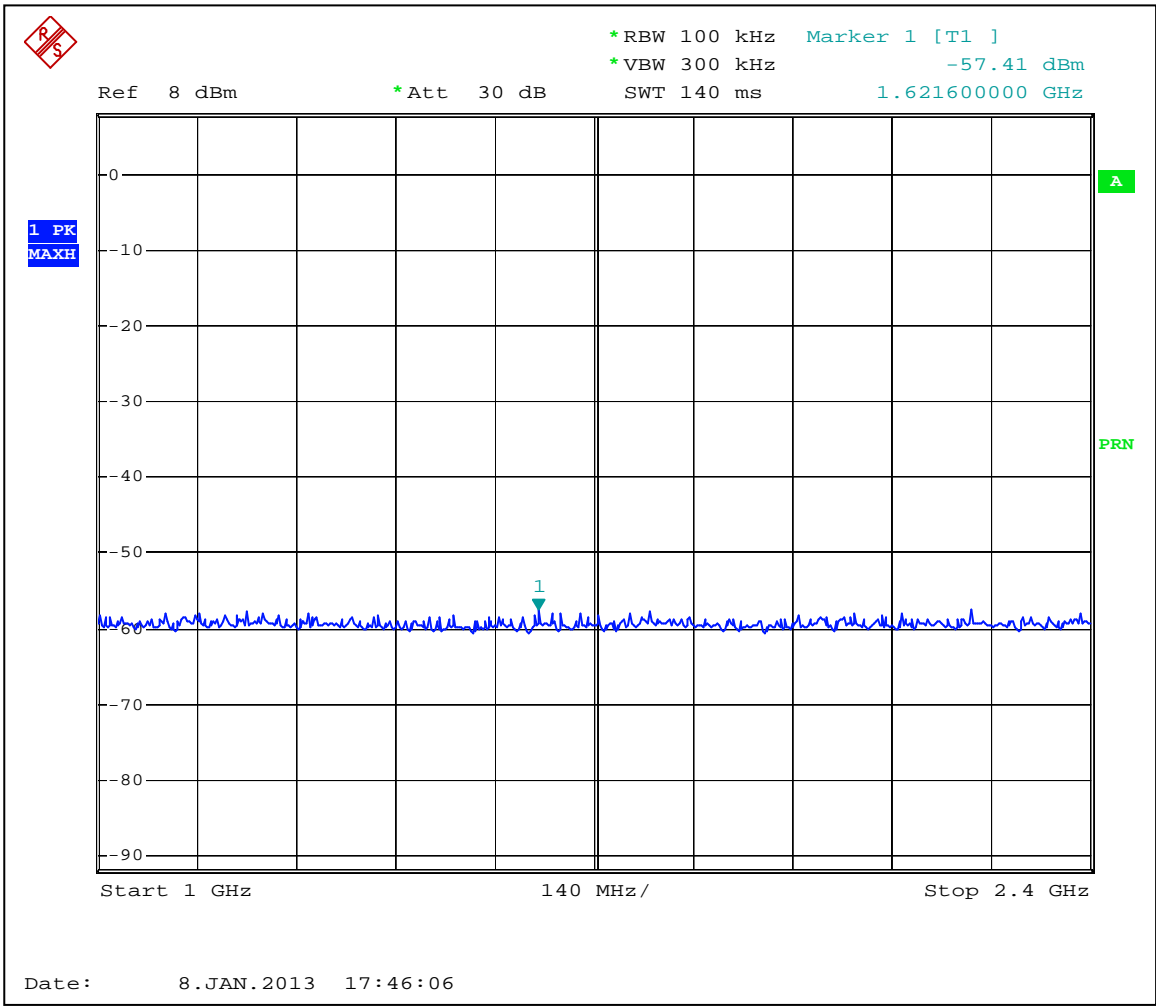




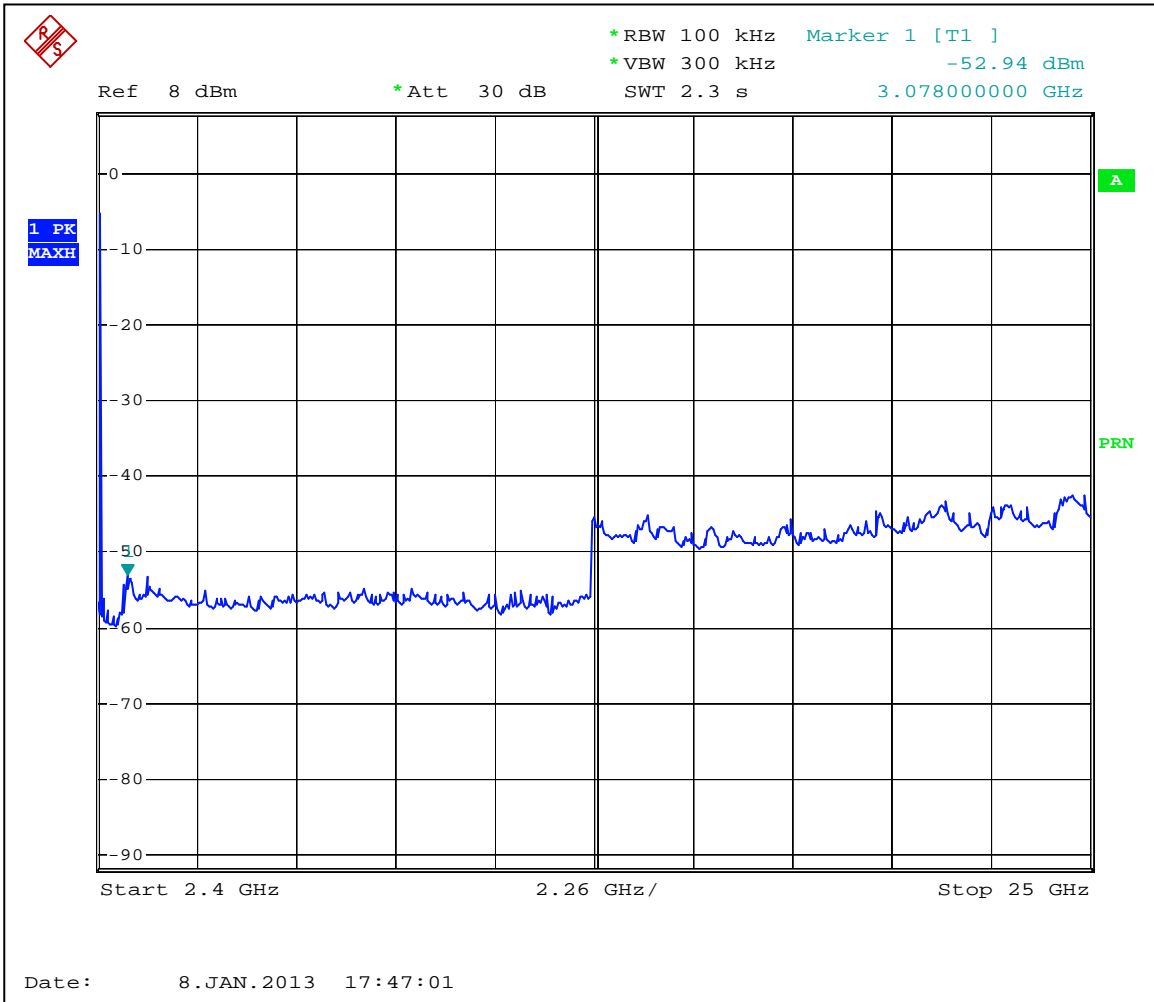












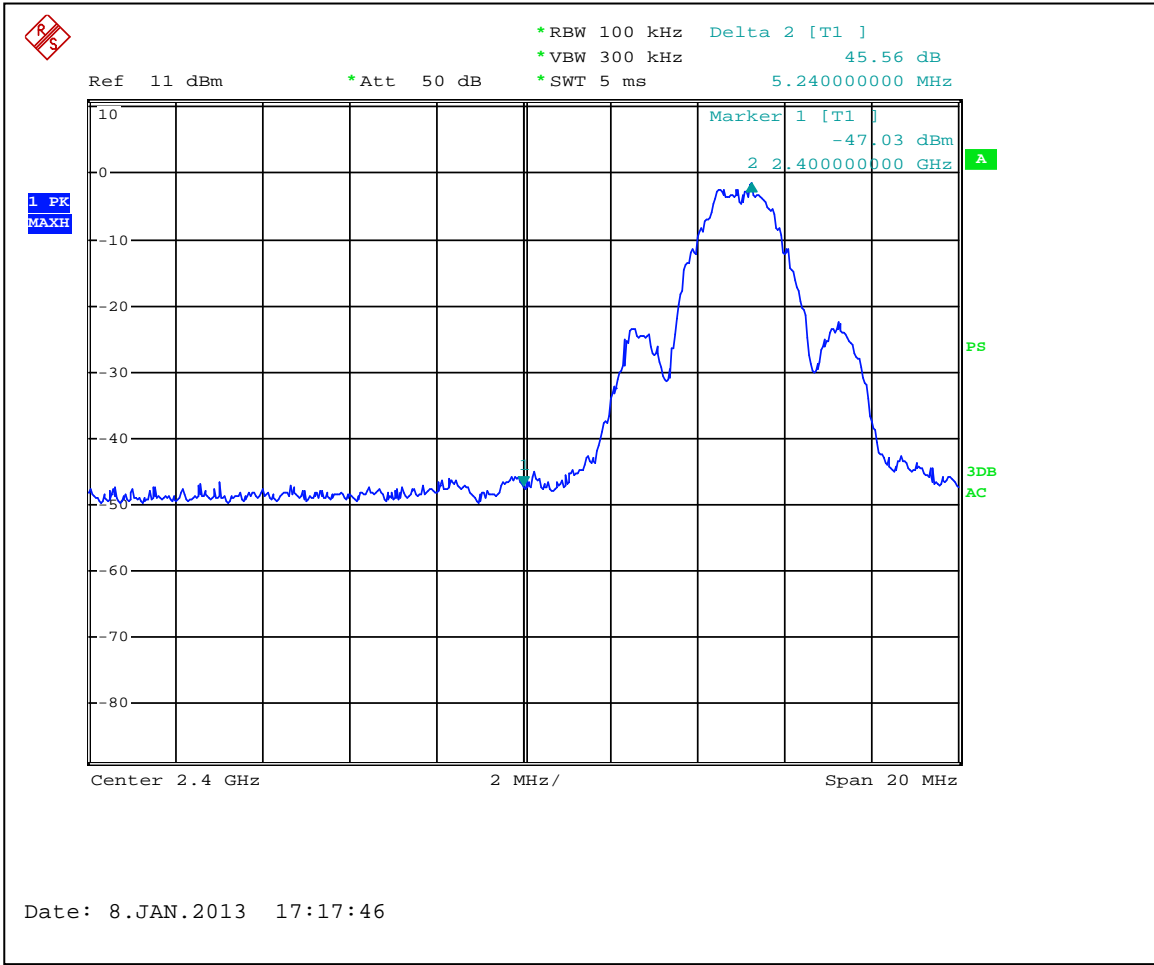


3.4.1 Antenna conducted band edge compliance

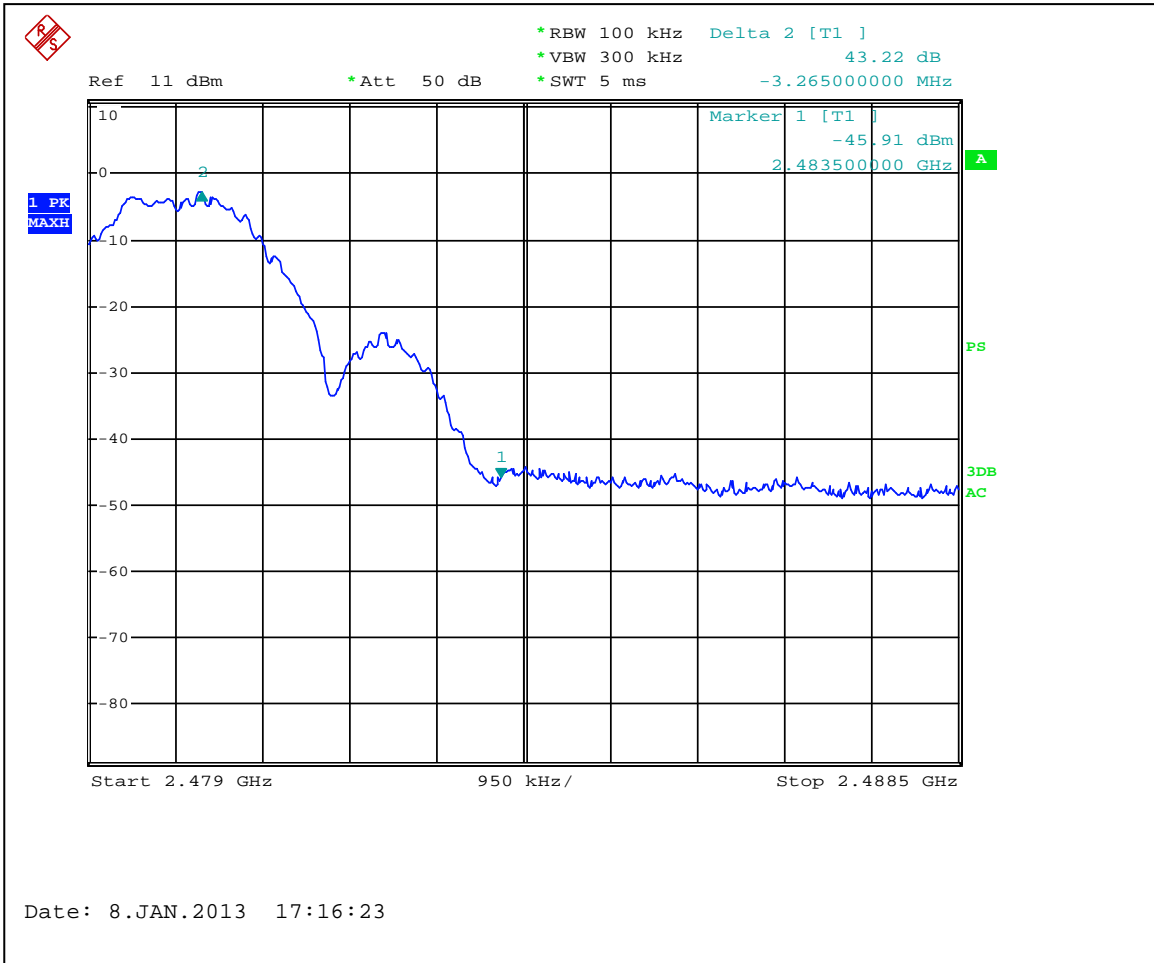
<b>Frequency Range:</b>	<input type="checkbox"/> 902-928MHz <input checked="" type="checkbox"/> 2400-2483.5MHz <input type="checkbox"/> 5725-5850MHz		
	<b>Minimum Measured Attenuation dB</b>	<b>Minimum Allowed Attenuation dB</b>	<b>Margin dB</b>
<b>Low Frequency Channel</b>	45.6	20	-25.4
<b>Upper Frequency Channel</b>	43.2	20	-23.2
<b>Analyzer Settings:</b>	<input checked="" type="checkbox"/> RBW=100KHz		
<b>Minimum Allowed Attenuation:</b>	<input checked="" type="checkbox"/> 20dB <input type="checkbox"/> 30dB (for digital systems with conducted power measured using RMS averaging over a time interval)		

Notes:        None

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Graph 3.4.10



**Graph 3.4.11**



### 3.5 Radiated spurious emissions

Test location:  OATS  Anechoic Chamber  Other

Test result: **Pass**

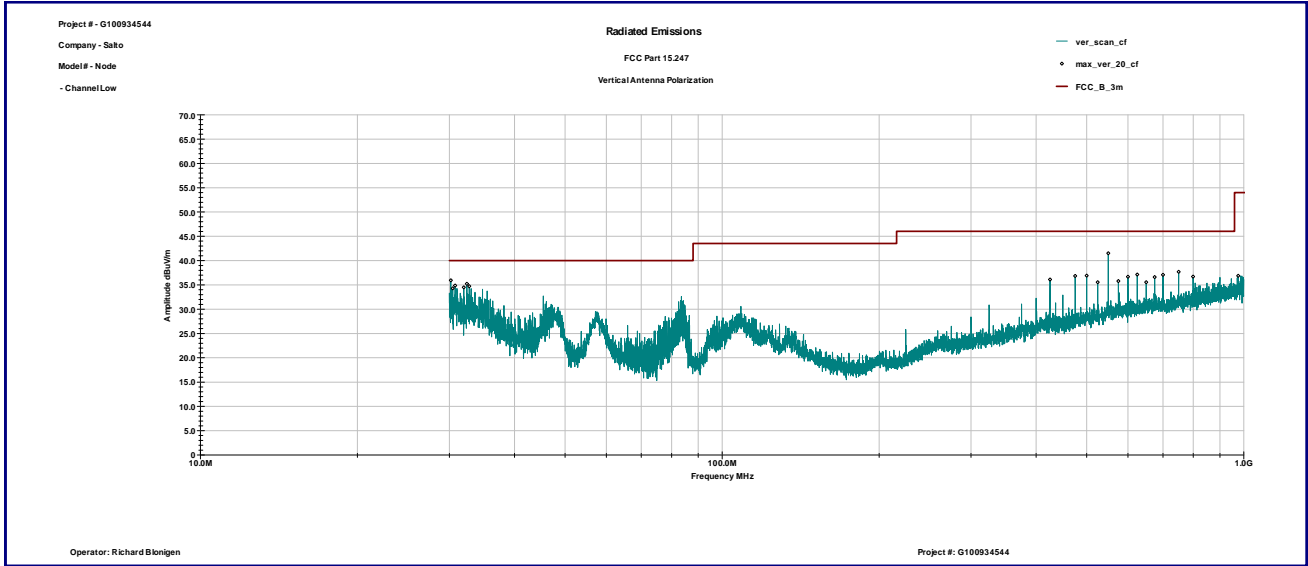
Max. Margin: 6.8dB below the limits

<b>Date:</b>	January 10-11, 2013	<b>Result: Pass</b>
<b>Standard:</b>	FCC part 15.247(d)	
<b>Tested by:</b>	Richard Blonigen	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	Emissions at fundamental frequency, spurious emissions and harmonics outside restricted band of operation per FCC 15.205, and spurious emissions not related with transmitter operations were excluded from the Table. Testing was performed at Low, Middle and Upper channels.	

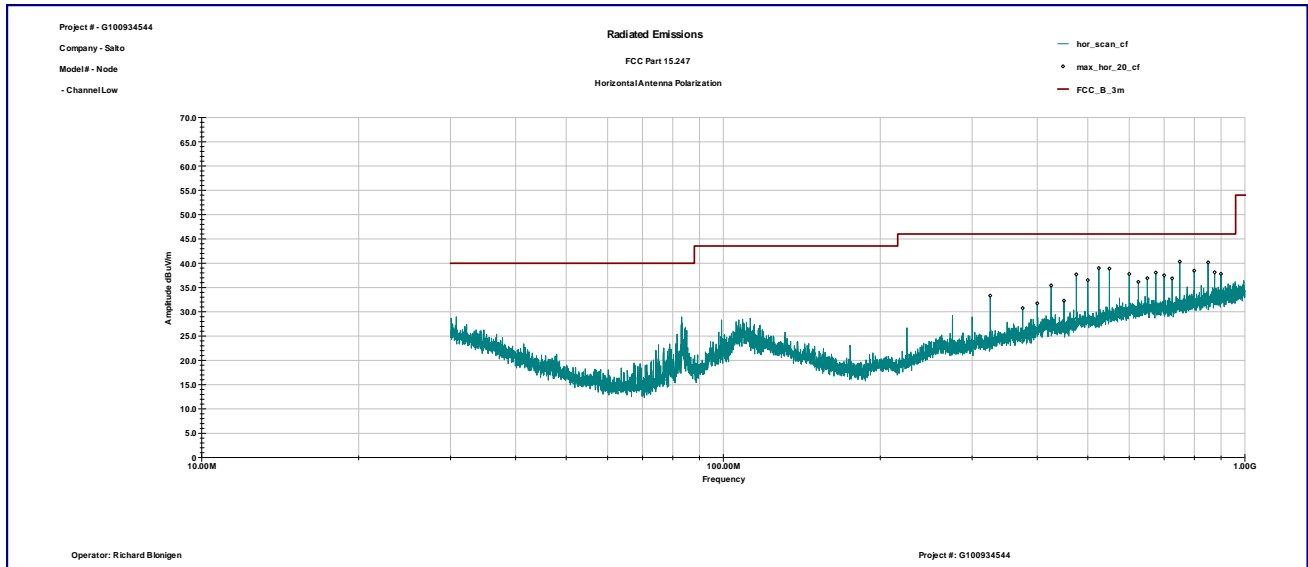
**Table 3.5.1**

Frequency MHz	Antenna Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
<b>Channel Low</b>							
7.2153 GHz	V	42.8	40.9	38.2	45.5	54.0	-8.5
4.8073 GHz	H	48.8	37.1	39.2	46.7	54.0	-7.3
7.2153 GHz	H	44.4	40.7	38.2	46.8	54.0	-7.2
9.6187 GHz	H	40.4	43.8	37.1	47.1	54.0	-6.9
<b>Channel Middle</b>							
4.8913 GHz	H	48.0	37.2	39.1	46.1	54.0	-7.9
7.332 GHz	H	42.6	41.0	38.1	45.6	54.0	-8.4
9.782 GHz	H	40.3	44.0	37.1	47.2	54.0	-6.8
<b>Channel High</b>							
7.444 GHz	V	41.9	41.6	38.0	45.5	54.0	-8.5
4.9613 GHz	H	47.8	37.3	39.0	46.2	54.0	-7.8
7.4393 GHz	H	43.8	41.3	38.0	47.1	54.0	-6.9

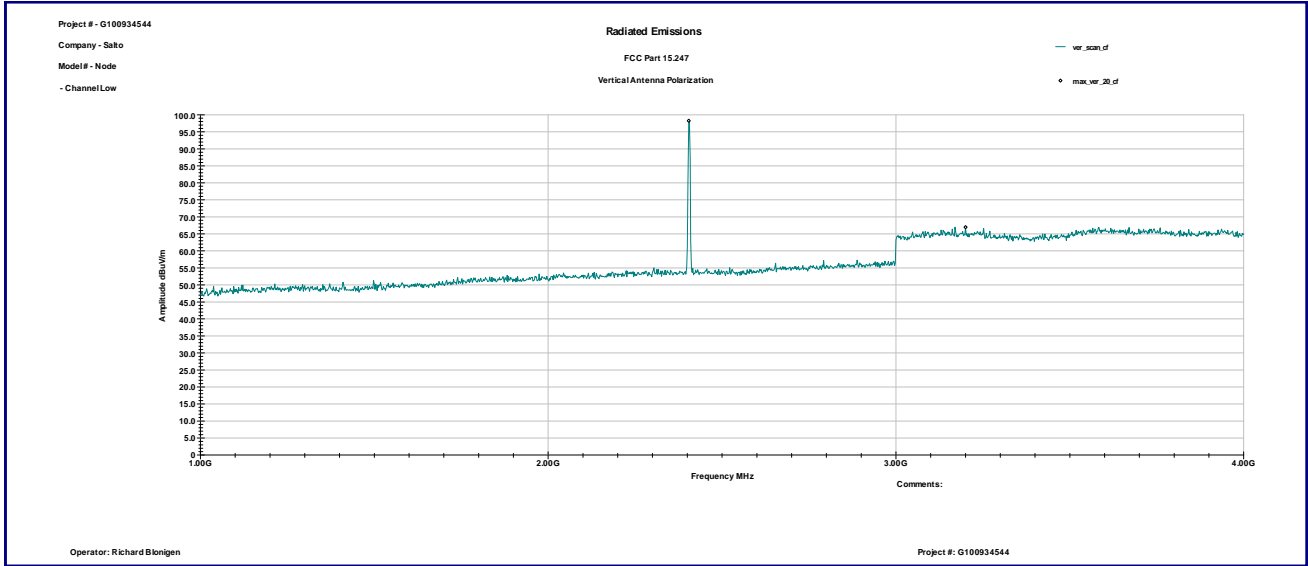
Comment:



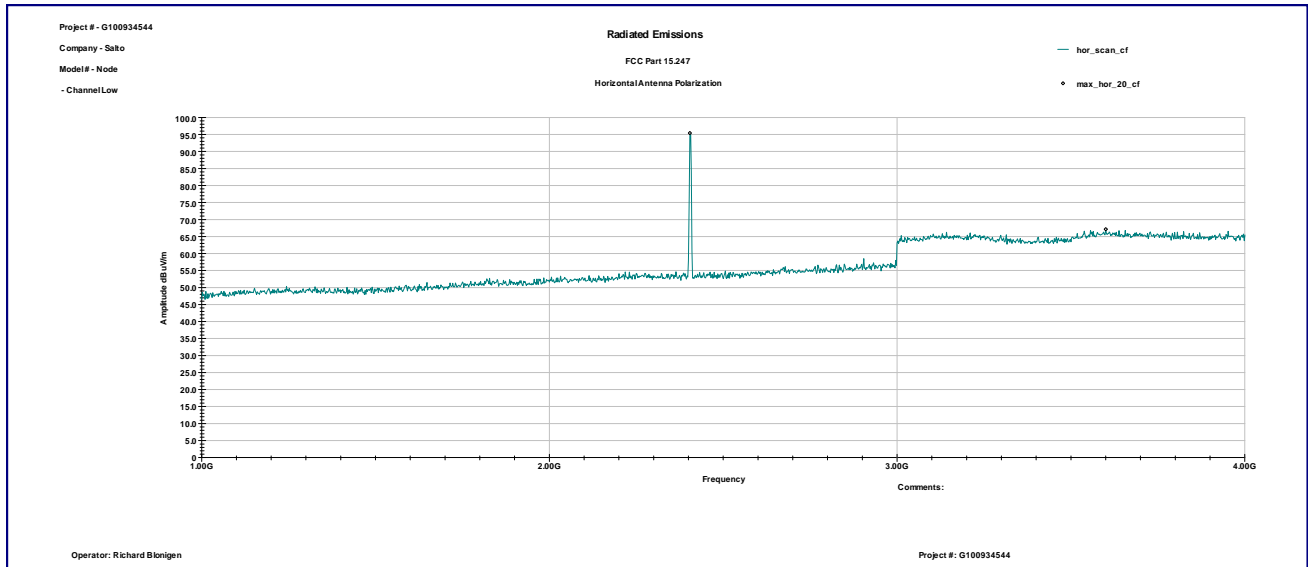
Graph 3.5.1



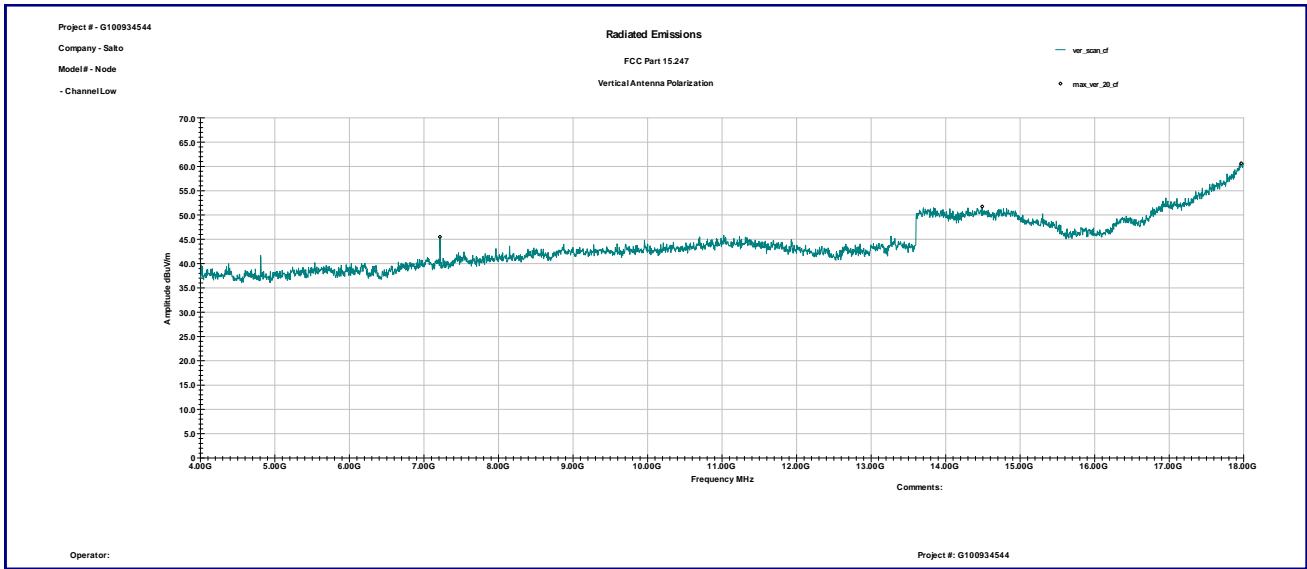
Graph 3.5.2



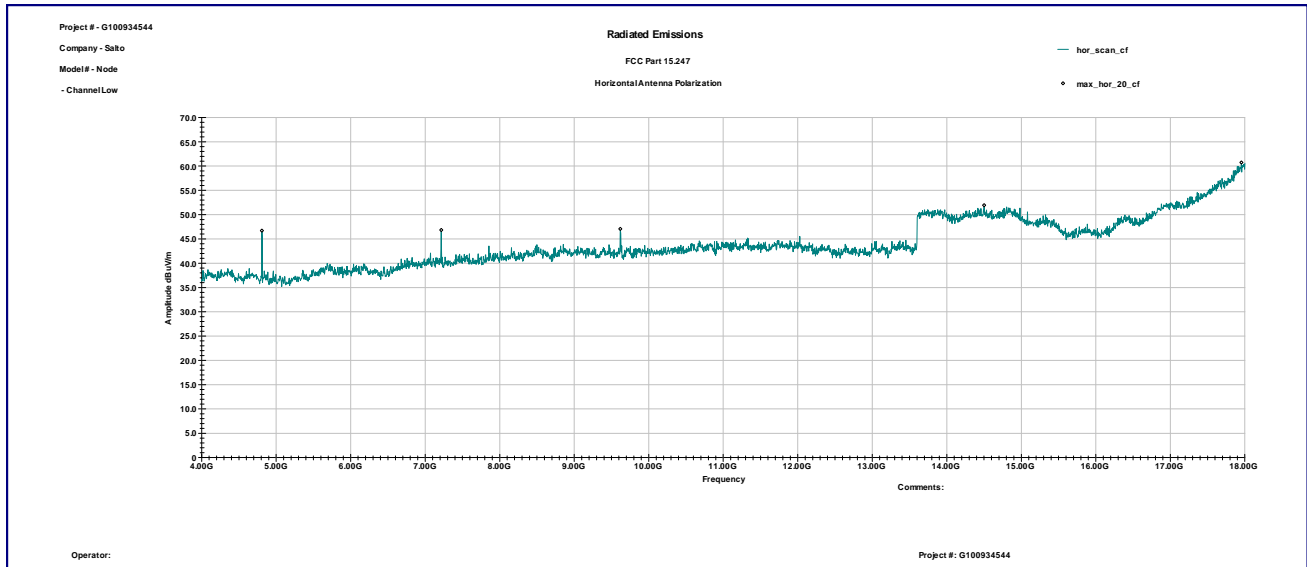
Graph 3.5.3



Graph 3.5.4

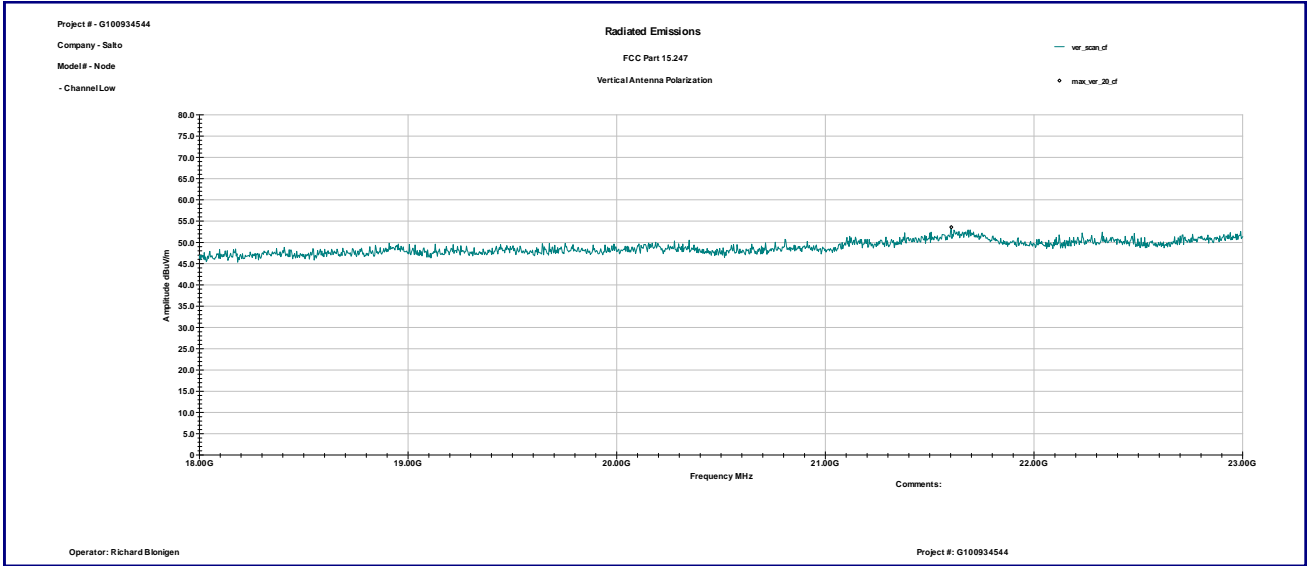


Graph 3.5.5

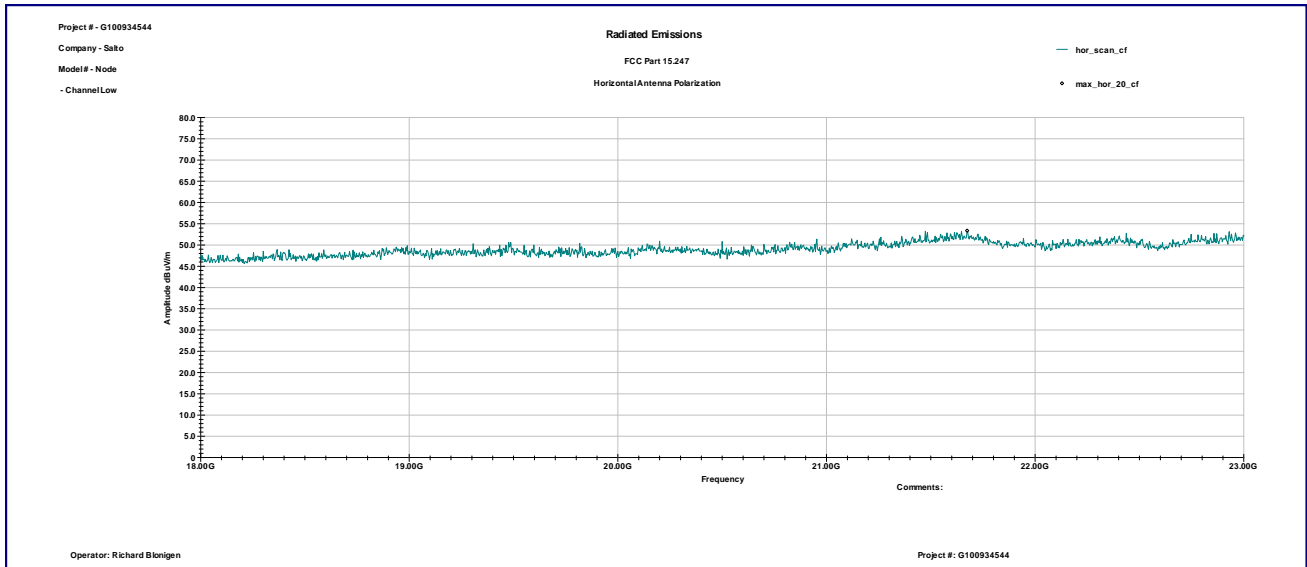


Graph 3.5.6

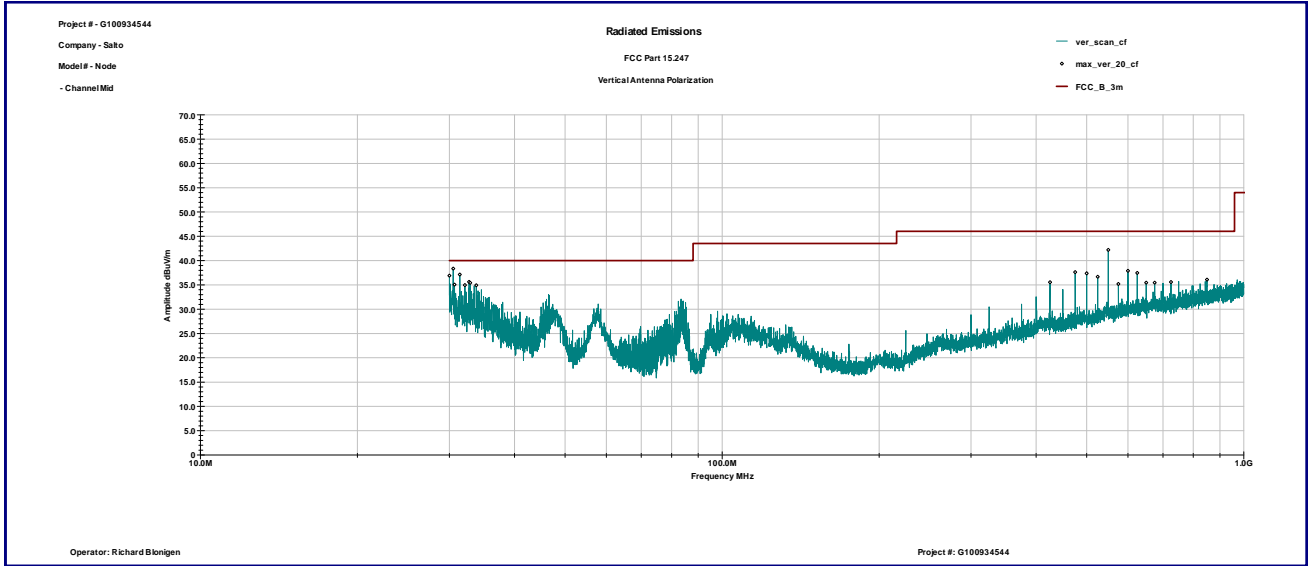




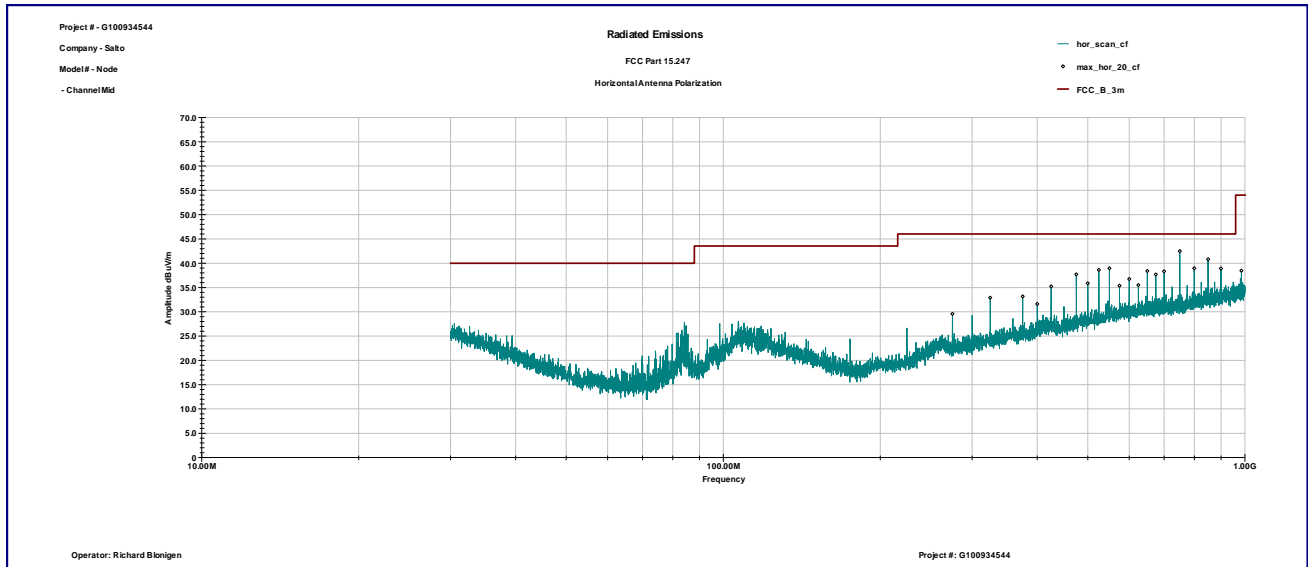
Graph 3.5.7



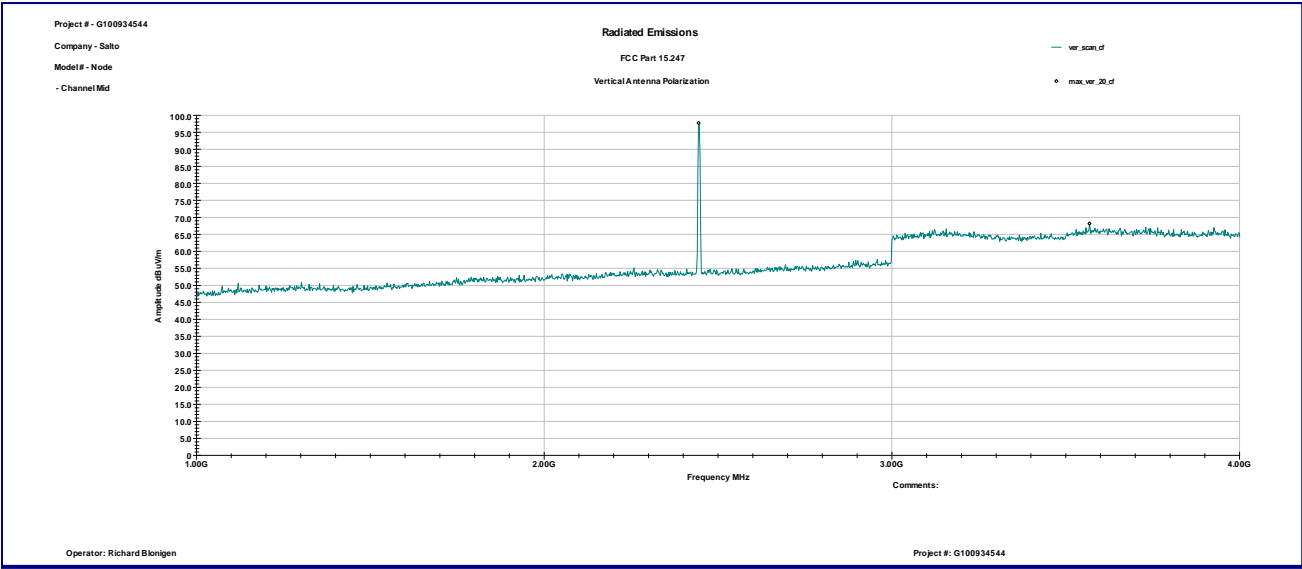
Graph 3.5.8



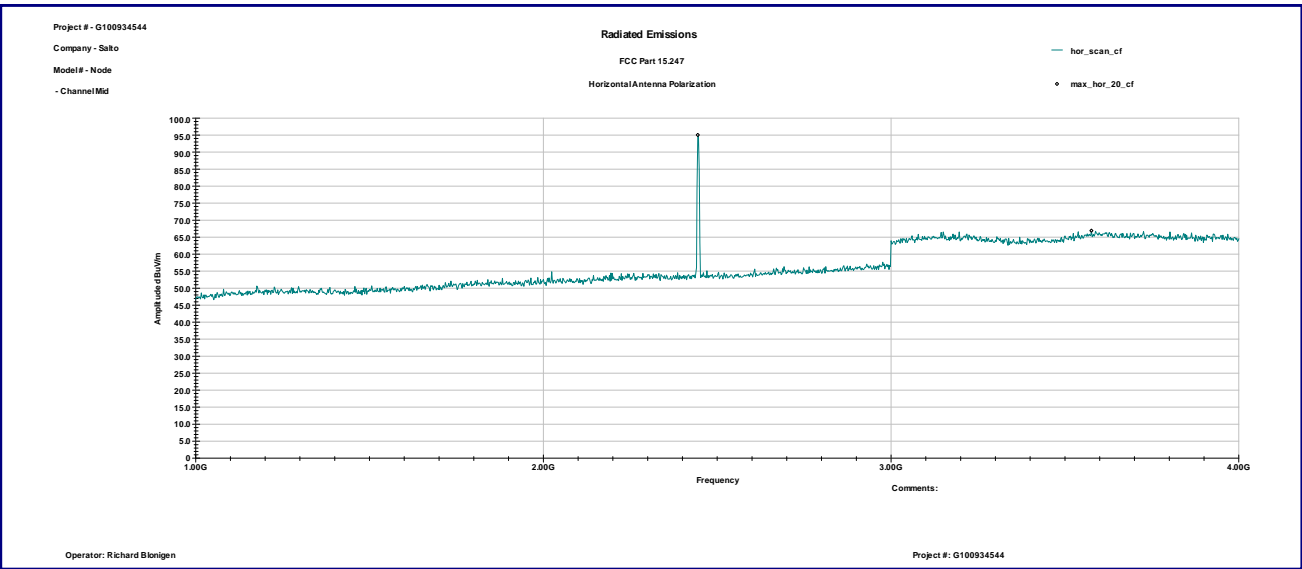
Graph 3.5.9



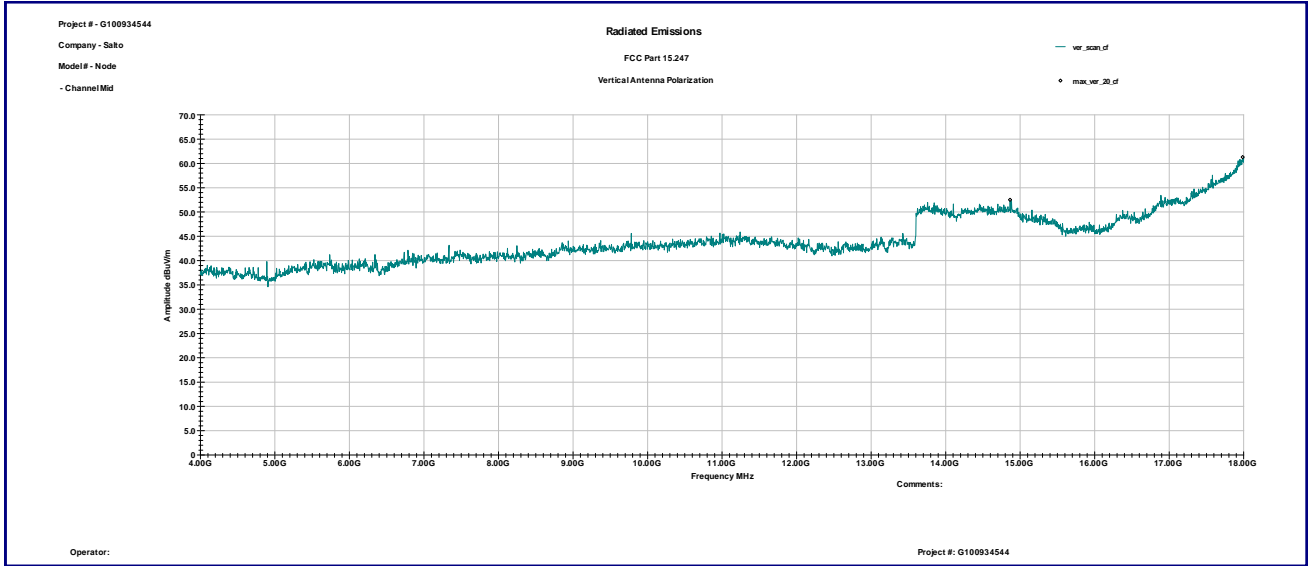
Graph 3.5.10



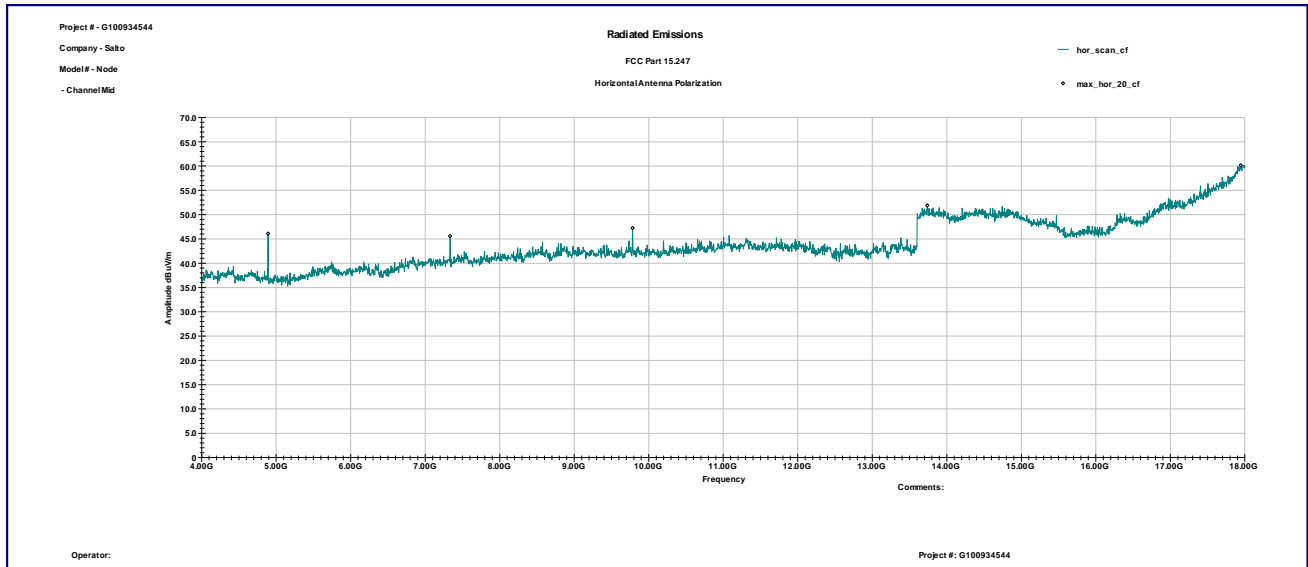
Graph 3.5.11



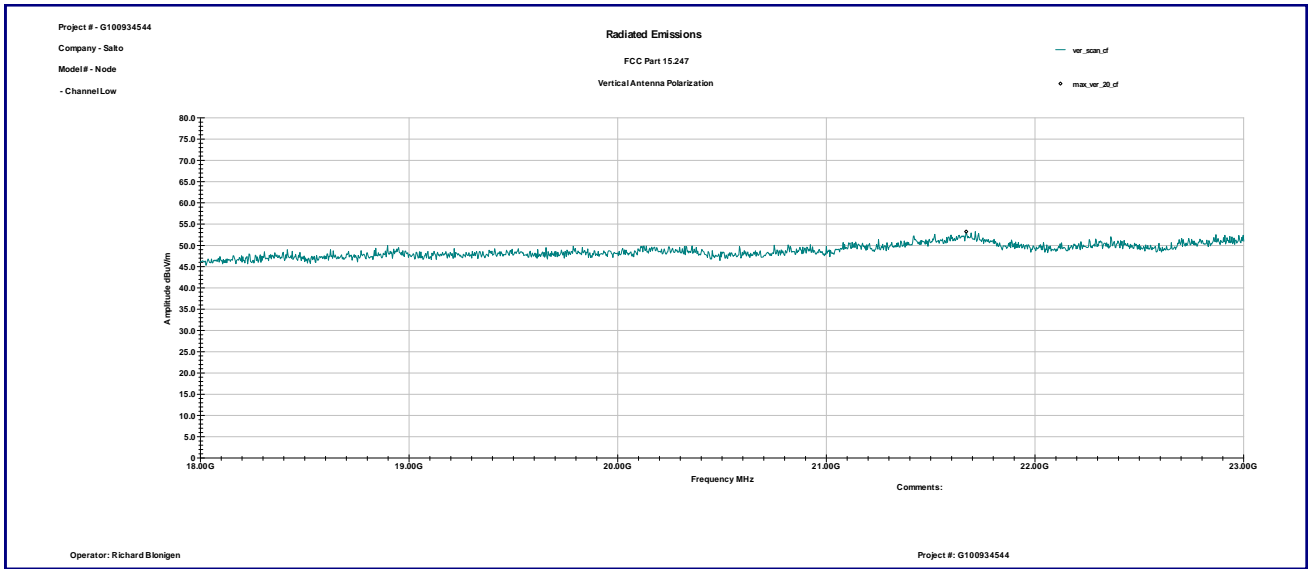
Graph 3.5.12



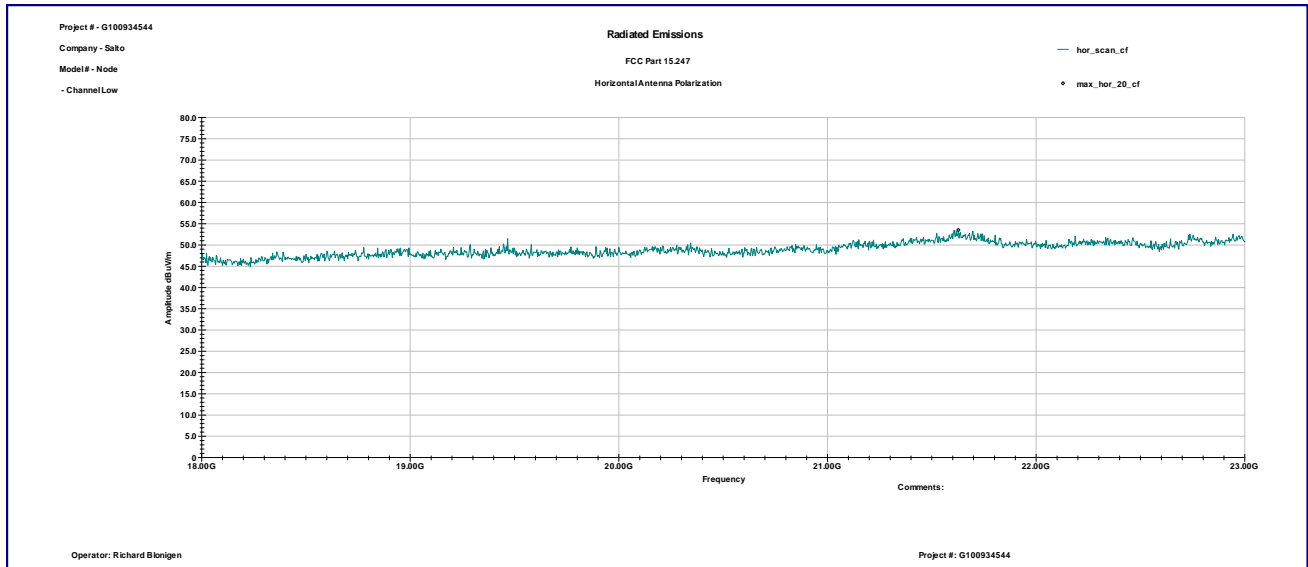
Graph 3.5.13



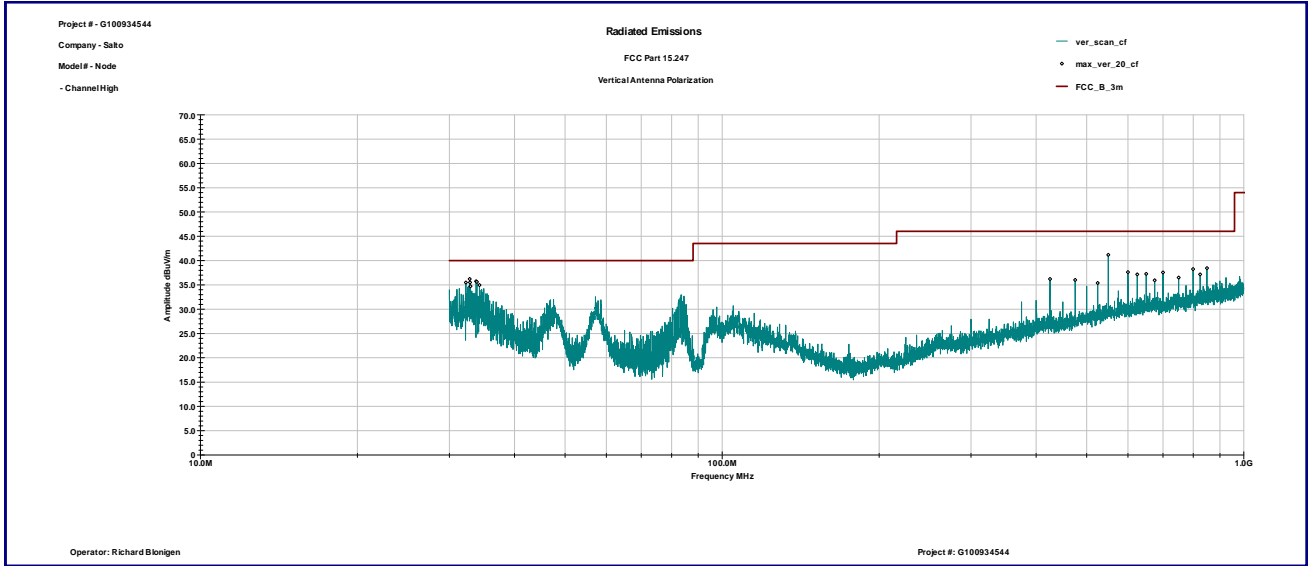
Graph 3.5.14



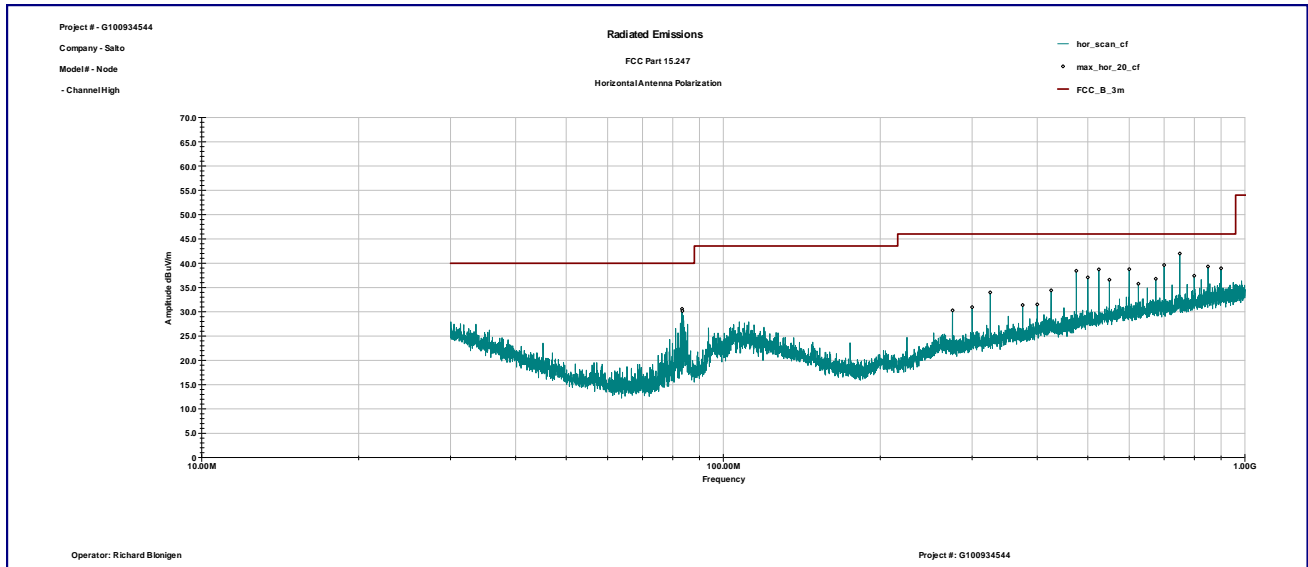
Graph 3.5.15



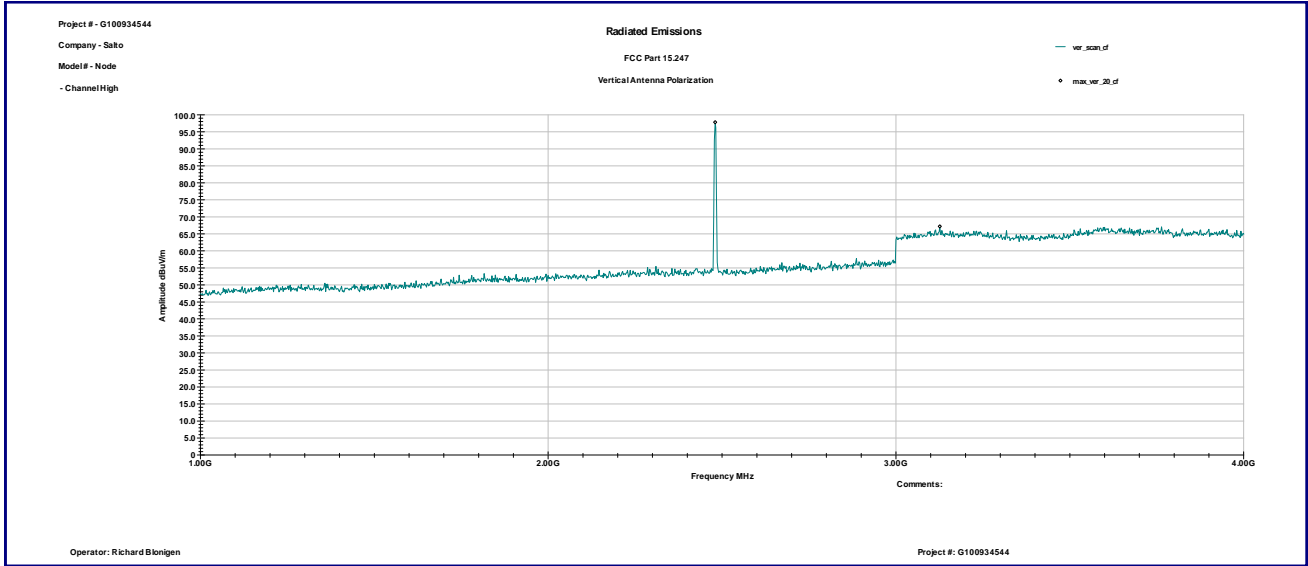
Graph 3.5.16



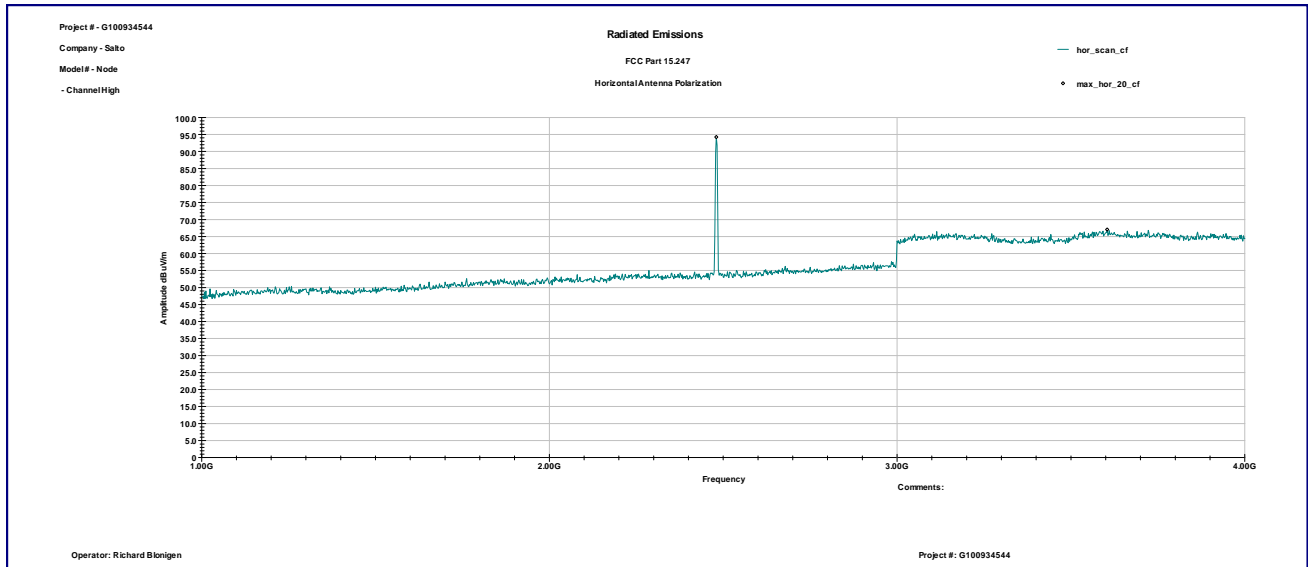
**Graph 3.5.17**



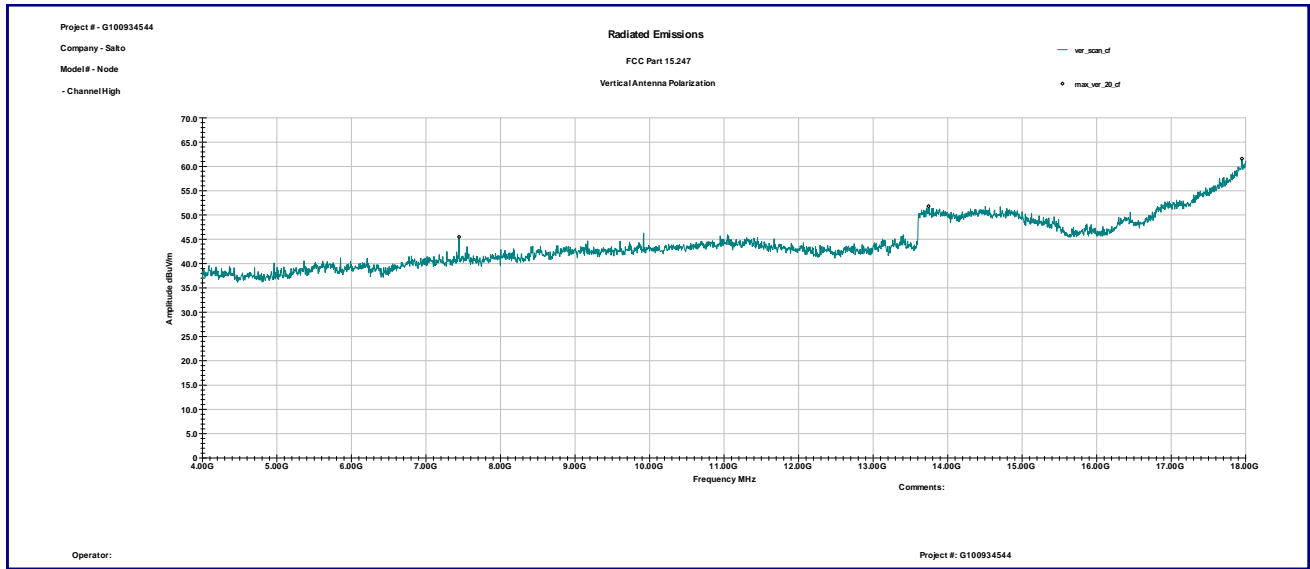
**Graph 3.5.18**



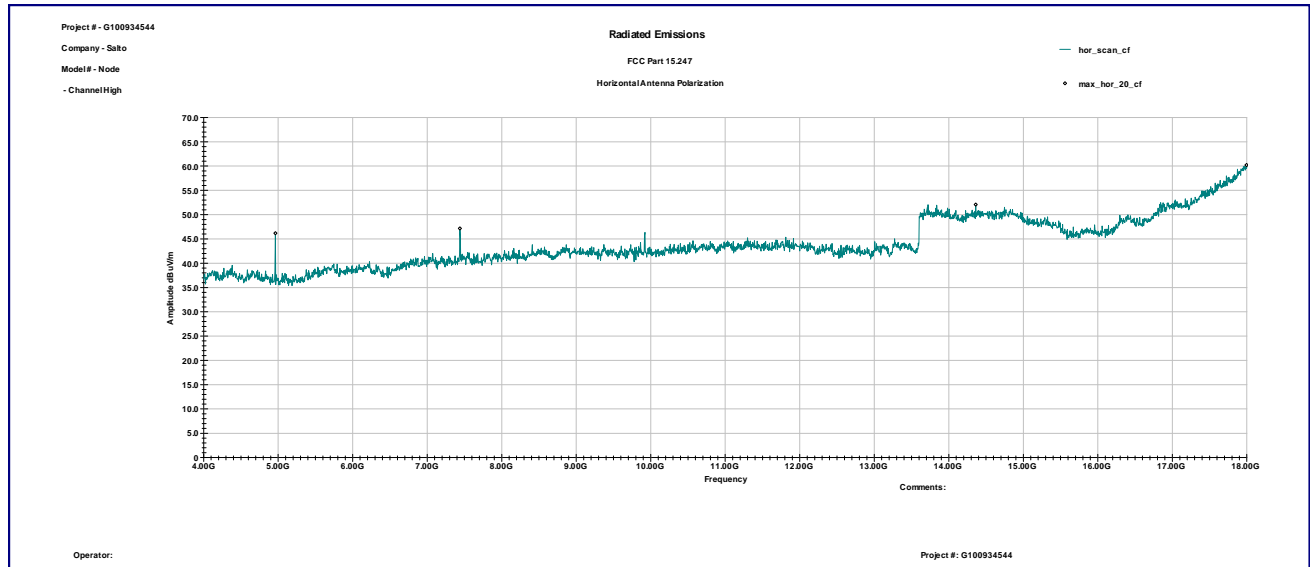
Graph 3.5.19



Graph 3.5.20

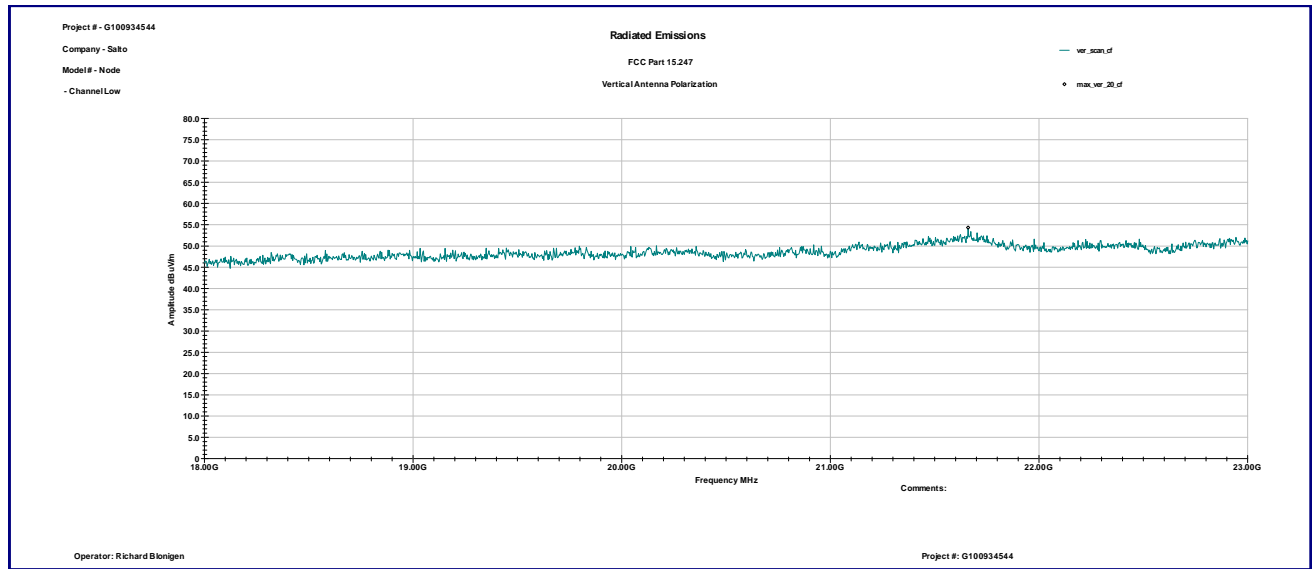


Graph 3.5.21

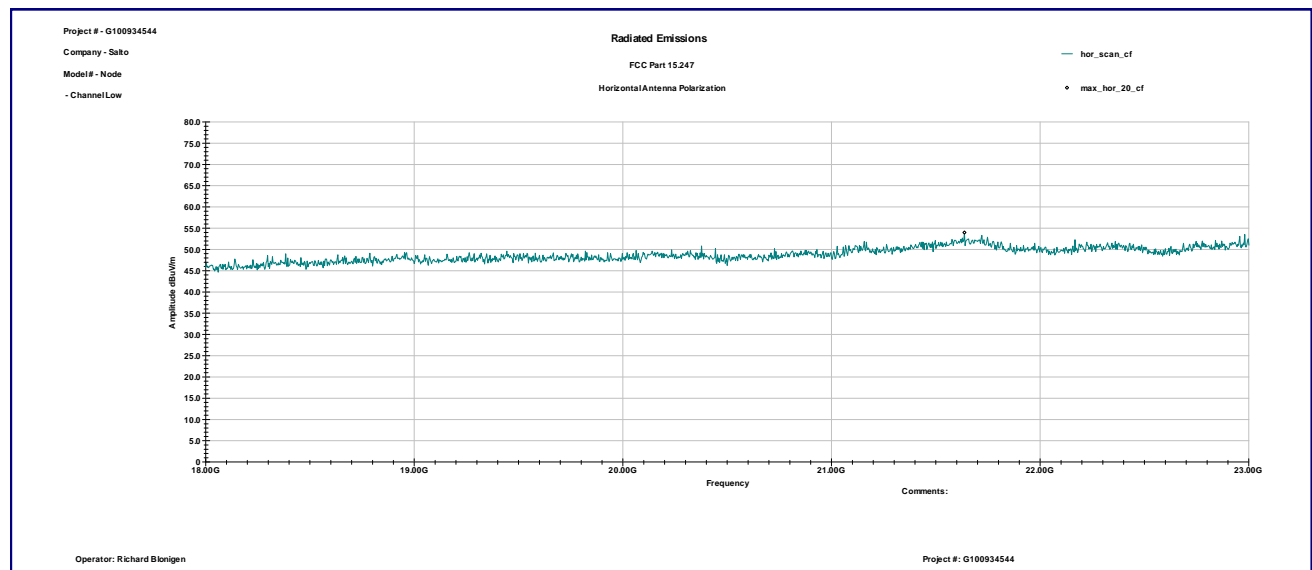


Graph 3.5.22





### Graph 3.5.23



### Graph 3.5.24



### 3.6 RF Exposure Compliance

The maximum measured antenna conducted power, P is 2.9dBm

The antenna gain, G is 3.3dBi

The maximum EIRP power = P + G  
ERP = 3.9+1.7= 6.2dBm, or 0.0041W=4.1W

The limits for Maximum Permissible Exposure (MPE) for transmitter operating at 2.4Hz, MPE is 1mW/cm<sup>2</sup>, or 10W/m<sup>2</sup>

$$S = 10W/m^2$$

The Power Density is related to EIRP with the equation:  
 $S = EIRP / 4\pi D^2$ , or  $10 = 0.0041 / 4\pi D^2$ , where D is a separation distance

The minimum safe separation distance, D = 0.6cm, which is below 20cm



**3.7 Transmitter power line conducted emissions**

**Test location:**             OATS             Anechoic Chamber     Other

**Test result:**            **Pass**

**Frequency range:**                            0.15MHz-30MHz

**Max. Emissions margin:**                    7.2dB below the limits

Notes:                    None

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<b>Date:</b>	January 11, 2013	<b>Result: Pass</b>
<b>Standard:</b>	FCC 15.207	
<b>Tested by:</b>	Richard Blonigen	
<b>Test Point:</b>	Power Line	
<b>Operation mode:</b>	See Page 5	
<b>Note:</b>	None	

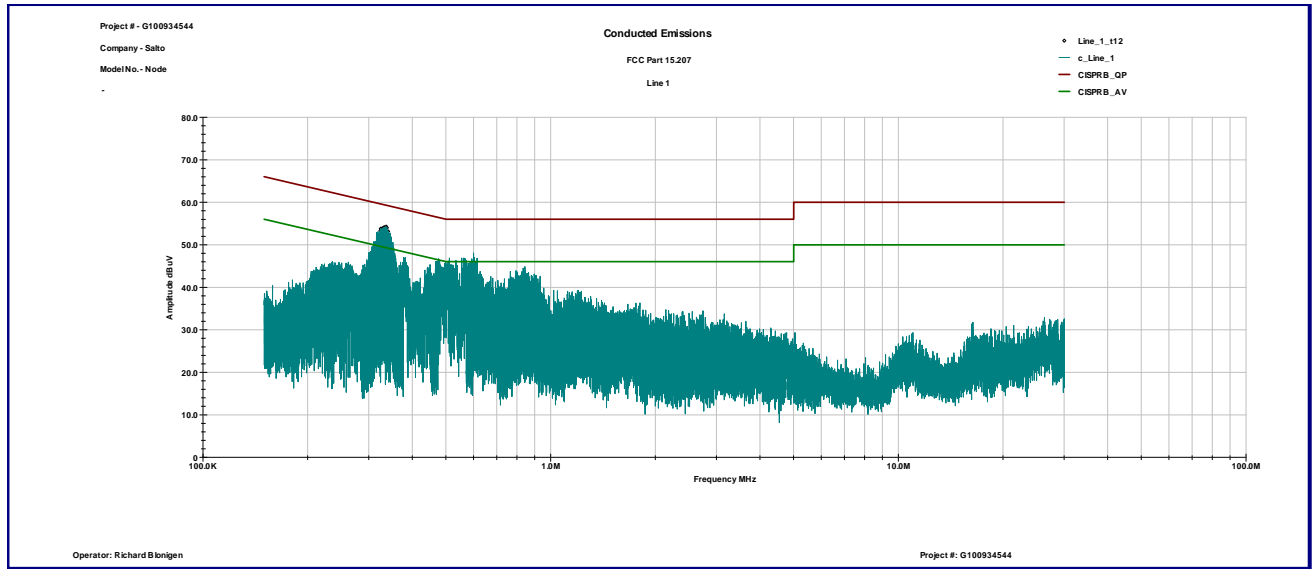
**Table 3.7.1**

**Line 1**

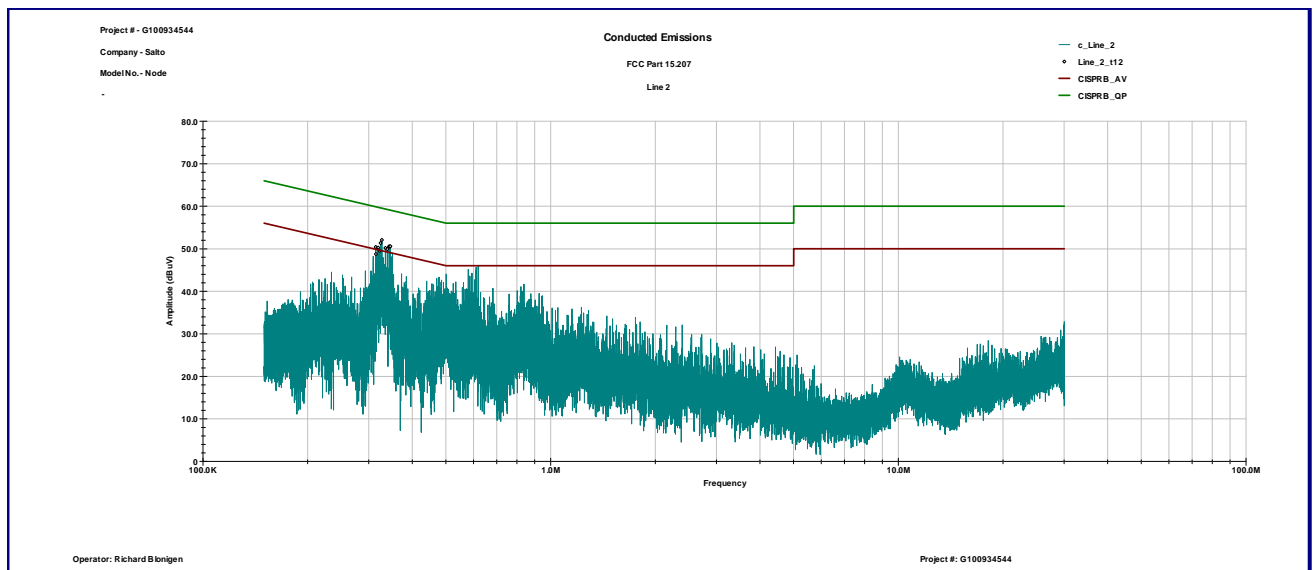
Frequency	QP dB $\mu$ V	AVG dB $\mu$ V	QP Limit dB $\mu$ V	AVG Limit dB $\mu$ V	QP Margin dB	AVG Margin dB
327.87 KHz	52.2	38.4	59.5	49.5	-7.3	-11.1
329.91 KHz	52.3	38.3	59.5	49.5	-7.2	-11.2
372.31 KHz	43.0	28.0	58.5	48.5	-15.5	-20.5
479.99 KHz	43.6	29.5	56.3	46.3	-12.7	-16.9
559.02 KHz	42.4	26.3	56.0	46.0	-13.6	-19.8
601.49 KHz	43.7	29.3	56.0	46.0	-12.3	-16.7

**Line 2**

Frequency	QP dB $\mu$ V	AVG dB $\mu$ V	QP Limit dB $\mu$ V	AVG Limit dB $\mu$ V	QP Margin dB	AVG Margin dB
317.22 KHz	43.6	28.7	59.8	49.8	-16.2	-21.1
331.48 KHz	45.1	30.4	59.4	49.4	-14.4	-19.0
338.99 KHz	43.8	28.6	59.2	49.2	-15.5	-20.7
464.19 KHz	36.7	20.9	56.6	46.6	-20.0	-25.7
580.26 KHz	36.1	21.0	56.0	46.0	-19.9	-25.0
613.8 KHz	35.7	20.1	56.0	46.0	-20.3	-25.9



Graph 3.7.1



Graph 3.7.2



**3.8 Receiver/digital device radiated emissions**

**Test location:**  OATS  Anechoic Chamber

**Test distance:**  10 meters  3 meters

**Test result:** **Pass**

**Frequency range:** 30MHz-13GHz

**Max. Emissions margin:** 5.1dB below the limits

**Notes:** None



<b>Date:</b>	January 10-11, 2013	<b>Result: Pass</b>
<b>Standard:</b>	FCC Part 15.109, Class B	
<b>Tested by:</b>	Richard Blonigen	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	Frequency range 30MHz-1000MHz	

**Table 3.8.1**

Frequency	Ant. Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
30.193 MHz	V	13.2	20.1	33.3	40.0	-6.7
31.246 MHz	V	15.4	19.5	34.9	40.0	-5.1
32.106 MHz	V	13.9	18.9	32.8	40.0	-7.2
37.966 MHz	V	16.9	15.6	32.5	40.0	-7.5
112.82 MHz	V	21.1	13.7	34.8	43.5	-8.7
113.13 MHz	V	20.0	13.7	33.7	43.5	-9.8
116.08 MHz	V	20.3	13.8	34.1	43.5	-9.5
671.81 MHz	V	15.7	22.9	38.6	46.0	-7.5
840.56 MHz	V	9.9	24.7	34.6	46.0	-11.4
881.22 MHz	V	9.9	25.1	35.0	46.0	-11.0
925.08 MHz	V	10.7	25.5	36.2	46.0	-9.8
950.22 MHz	V	9.9	25.7	35.6	46.0	-10.4
30.86 MHz	H	7.1	19.7	26.8	40.0	-13.2
95.543 MHz	H	14.2	11.7	25.9	43.5	-17.6
113.61 MHz	H	13.3	13.8	27.0	43.5	-16.5
116.39 MHz	H	14.7	13.8	28.5	43.5	-15.0
116.96 MHz	H	12.8	13.8	26.6	43.5	-16.9
367.56 MHz	H	10.0	17.8	27.7	46.0	-18.3
413.0 MHz	H	8.5	19.7	28.2	46.0	-17.9
649.28 MHz	H	9.7	22.7	32.4	46.0	-13.6
671.53 MHz	H	18.0	22.9	40.9	46.0	-5.2
708.79 MHz	H	9.7	22.9	32.6	46.0	-13.4
836.86 MHz	H	9.5	24.6	34.1	46.0	-11.9
841.79 MHz	H	9.5	24.7	34.3	46.0	-11.8
924.84 MHz	H	10.6	25.5	36.0	46.0	-10.0

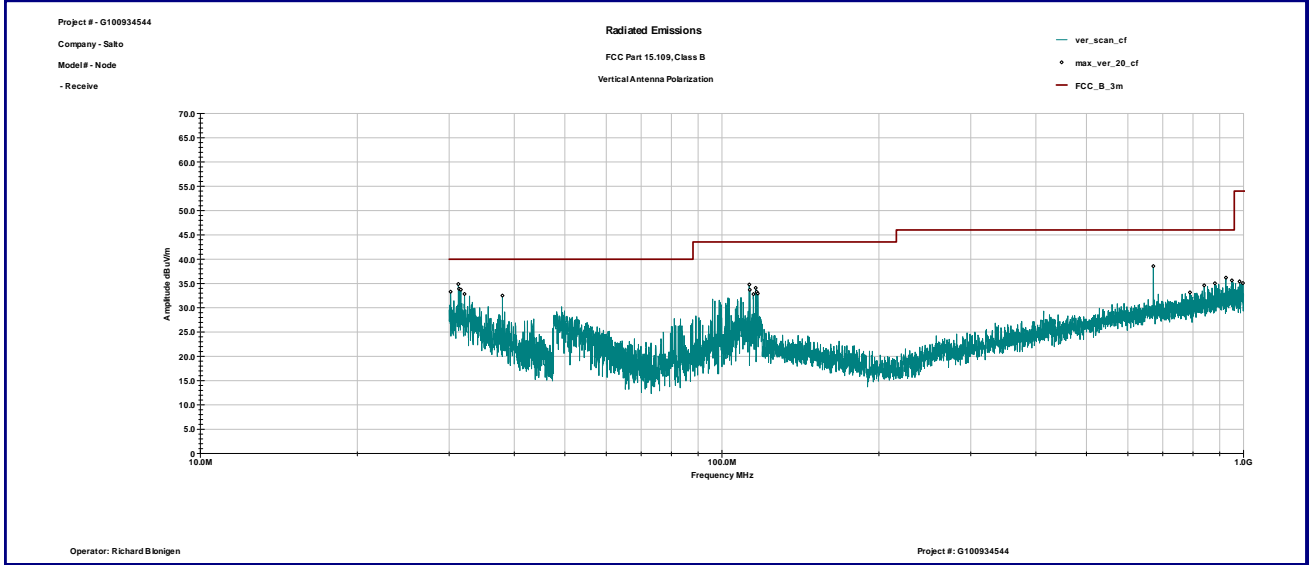


<b>Date:</b>	January 10-11, 2013	<b>Result: Pass</b>
<b>Standard:</b>	FCC Part 15.109, Class B	
<b>Tested by:</b>	Richard Blonigen	
<b>Test Point:</b>	Enclosure	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	Frequency range 1GHz-13GHz	

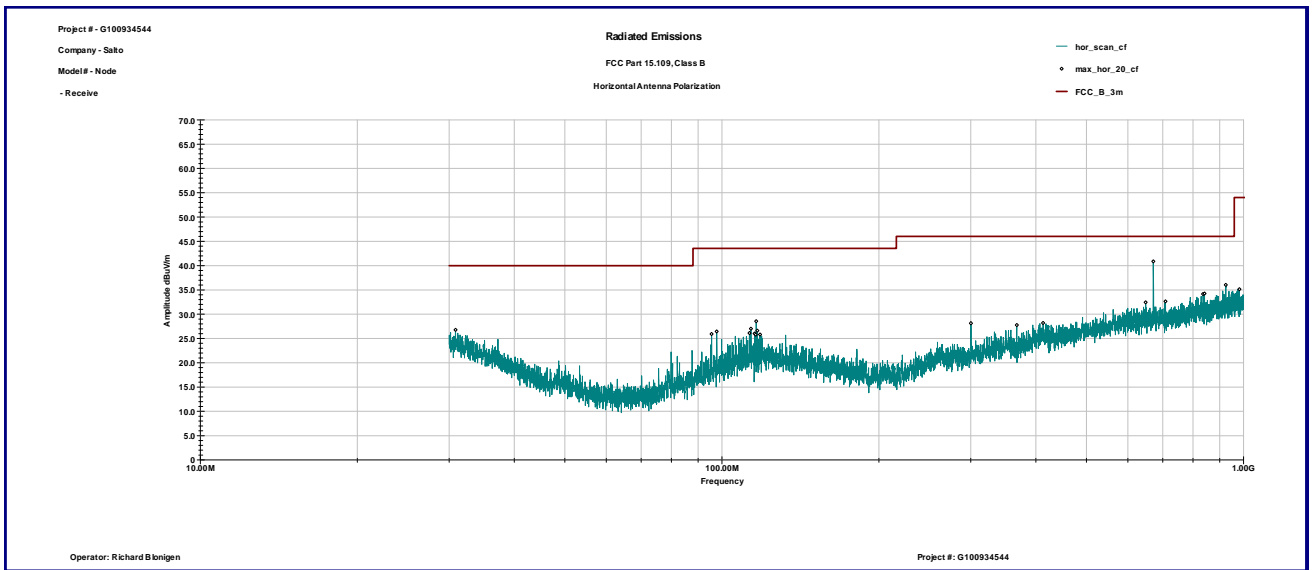
**Table 3.8.2**

Frequency MHz	Antenna Polarity	Peak Reading dB $\mu$ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
1.249 GHz	V	51.6	26.6	42.0	36.3	54.0	-17.7
1.3 GHz	V	50.7	26.8	41.9	35.6	54.0	-18.4
4.813 GHz	V	45.1	37.2	39.2	43.2	54.0	-10.8
1.099 GHz	H	49.8	26.0	42.1	33.8	54.0	-20.2
1.198 GHz	H	50.3	26.4	42.0	34.7	54.0	-19.2
1.249 GHz	H	51.1	26.6	42.0	35.8	54.0	-18.2
1.3 GHz	H	49.8	26.8	41.9	34.6	54.0	-19.3
4.813 GHz	H	49.9	37.1	39.2	47.9	54.0	-6.1

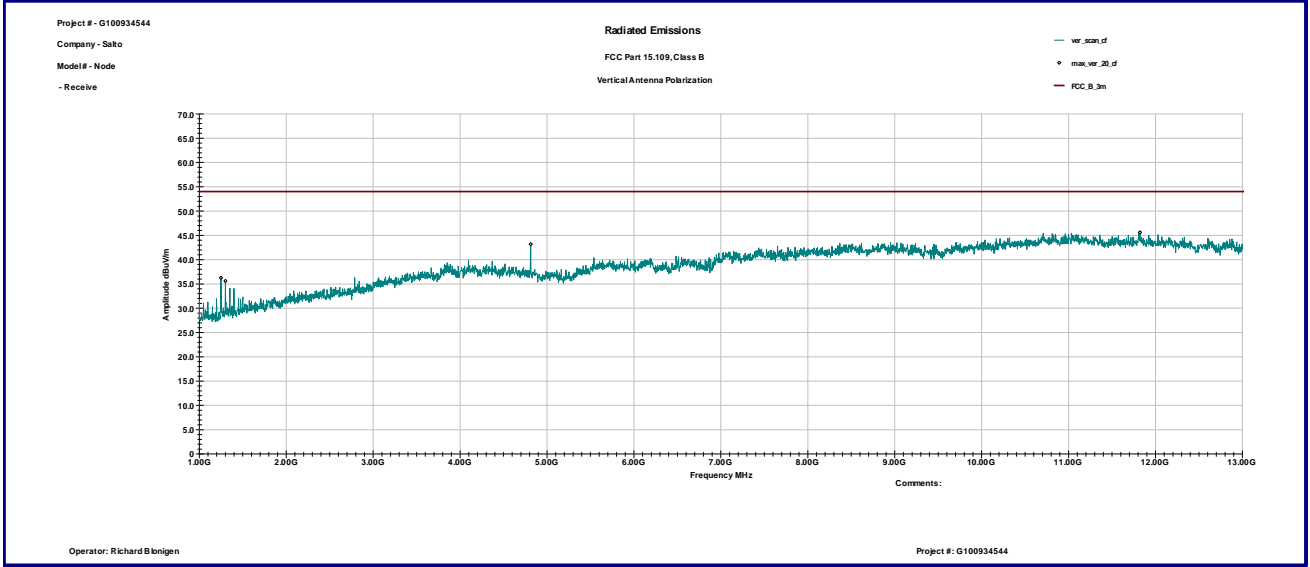




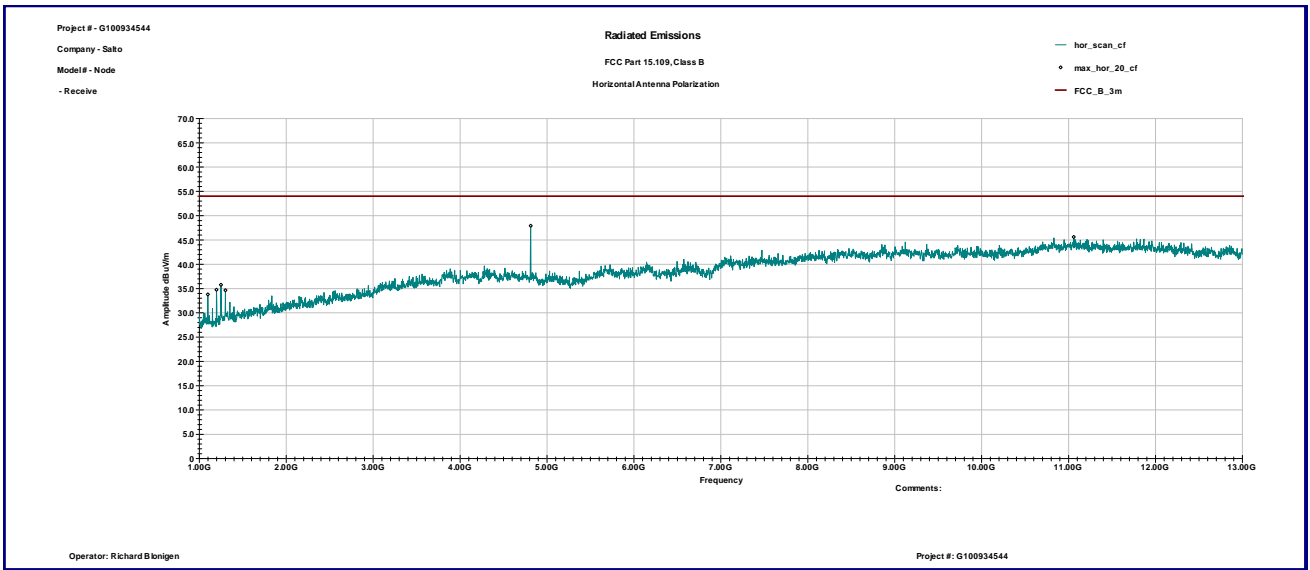
Graph 3.8.1



Graph 3.8.2



Graph 3.8.3



Graph 3.8.4



**3.9 Digital device conducted emissions**

**Test location:**             OATS           Anechoic Chamber    Other

**Test result:**             **Pass**

**Frequency range:**                                        0.15MHz-30MHz

**Max. Emissions margin:**                                        7.2dB below the limits

**Notes:**                  None

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<b>Date:</b>	January 11, 2013	<b>Result: Pass</b>
<b>Standard:</b>	FCC 15.107, Class B	
<b>Tested by:</b>	Richard Blonigen	
<b>Test Point:</b>	Power Line	
<b>Operation mode:</b>	See page 5	
<b>Note:</b>	None	

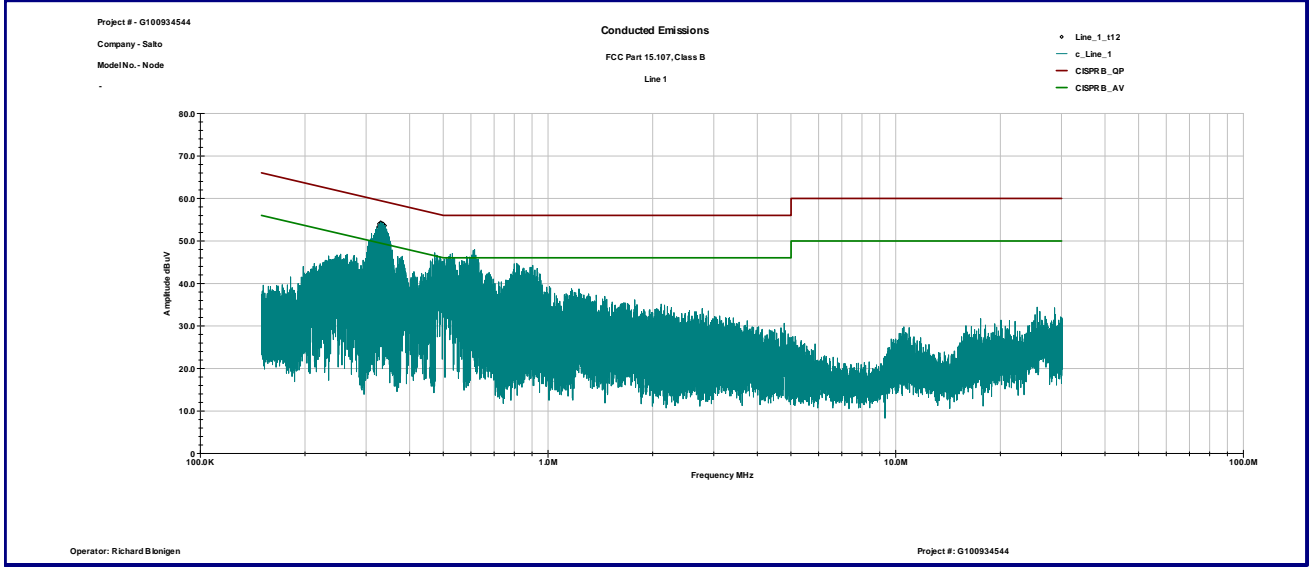
**Table 3.9.1**

**Line 1**

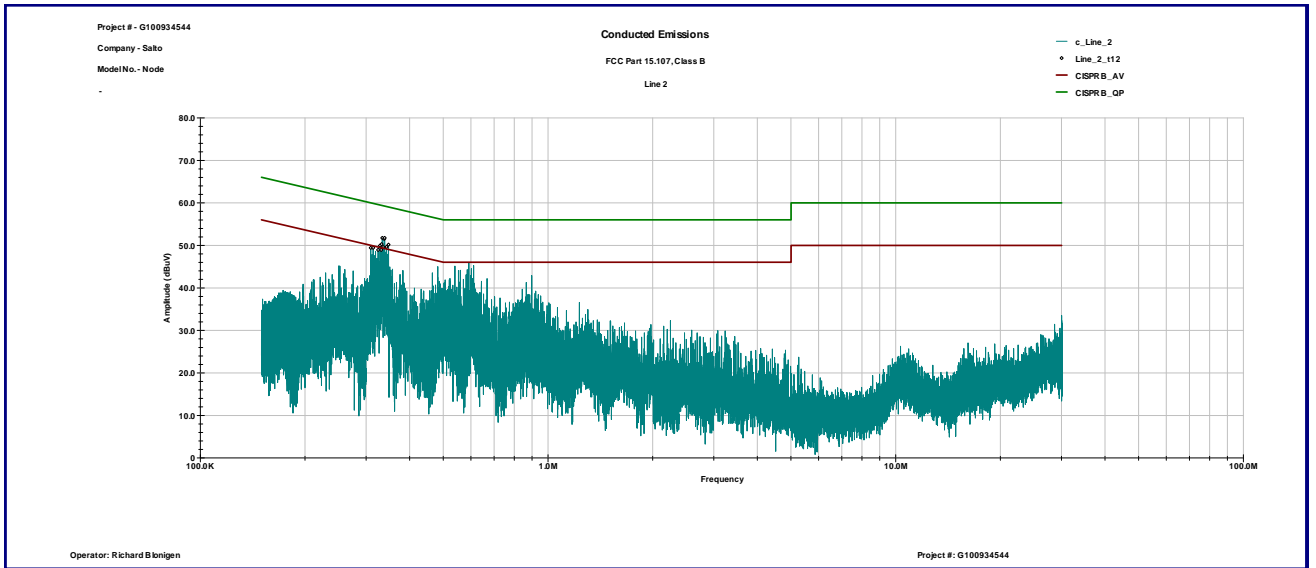
Frequency	QP dB $\mu$ V	AVG dB $\mu$ V	QP Limit dB $\mu$ V	AVG Limit dB $\mu$ V	QP Margin dB	AVG Margin dB
328.92 KHz	52.1	38.0	59.5	49.5	-7.3	-11.5
333.78 KHz	52.2	38.6	59.4	49.4	-7.2	-10.8
370.62 KHz	42.7	28.4	58.5	48.5	-15.8	-20.1
480.23 KHz	43.0	27.5	56.3	46.3	-13.4	-18.8
529.45 KHz	43.3	27.7	56.0	46.0	-12.7	-18.3
618.52 KHz	44.3	28.4	56.0	46.0	-11.7	-17.6

**Line 2**

Frequency	QP dB $\mu$ V	AVG dB $\mu$ V	QP Limit dB $\mu$ V	AVG Limit dB $\mu$ V	QP Margin dB	AVG Margin dB
317.43 KHz	43.1	28.4	59.8	49.8	-16.7	-21.4
332.91 KHz	44.8	31.0	59.4	49.4	-14.5	-18.4
376.9 KHz	36.7	22.0	58.4	48.4	-21.6	-26.4
475.52 KHz	37.1	19.8	56.4	46.4	-19.4	-26.6
533.71 KHz	36.9	20.0	56.0	46.0	-19.1	-26.0
613.97 KHz	37.3	22.0	56.0	46.0	-18.7	-24.0



Graph 3.9.1



Graph 3.9.2



#### 4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	11/29/2013	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	07/02/2013	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Teseq	CBL6112D	32859	25289	08/09/2013	<input checked="" type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-2 MOD.SD	316	9945	07/17/2013	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	9936	05/16/2013	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	11/01/2013	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	11/01/2013	<input checked="" type="checkbox"/>
High Pass Filter	Reactel	7HS-4G-S12	0223	015274	VBU	<input checked="" type="checkbox"/>
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>